Telephony

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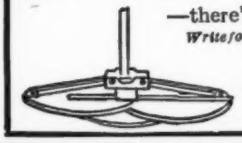

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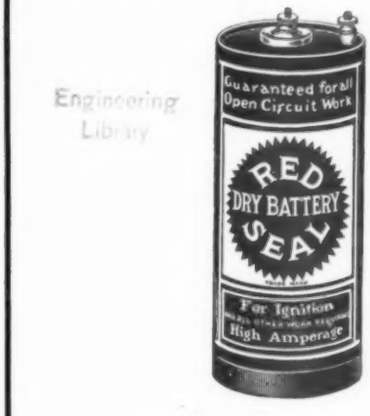

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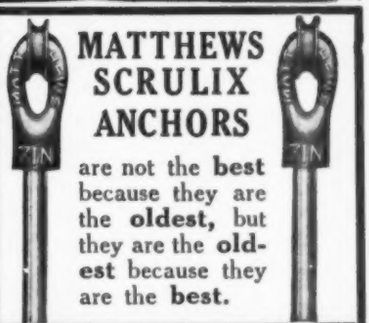

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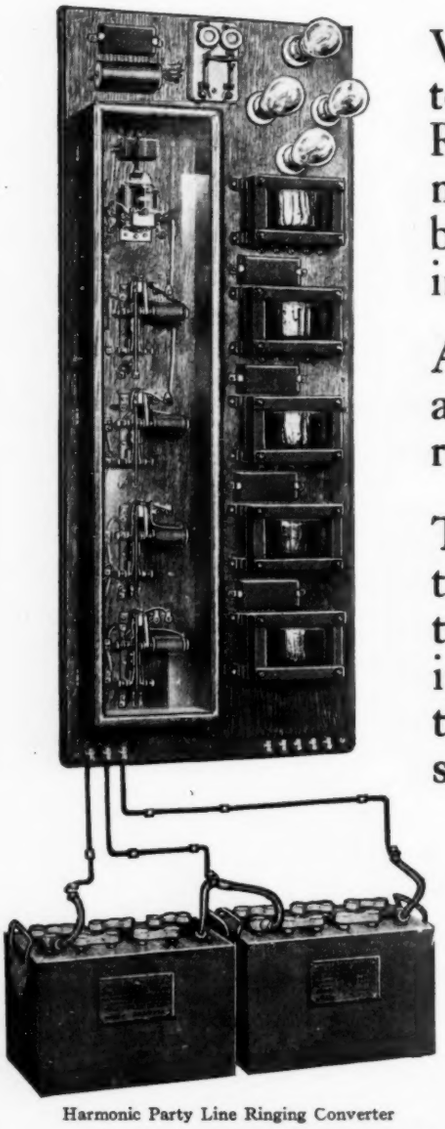

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By the Way—

The greatest benefit derived from the annual convention of the Independent telephone forces has always been co-operation among their members.

In the great European war representatives of the allies hold conferences from time to time to exchange ideas, discuss plans, and perfect a program of united, efficient action.

It would be welcome news for the Kaiser to hear that the allies' conference had been postponed six months. If he had an emissary who could defer such a council until next June, for instance, that emissary would be on the job at once.

One of our telephone journal contemporaries boldly says that the proposition to defer the Independent convention "smacks of Bell diplomacy." If the Bell interests desire the national meeting postponed, it is a good sign that it would be to the advantage of the Independents to hold it as usual.

Advertisements as Salesmen.

"Arguments as to why manufacturers and others having something to sell should advertise in the business magazines or trade journals are usually backed up by facts," stated an editor of a business paper in another field than that of TELEPHONY. "Here is a true story which happened lately in our field," he continued, "and a prospective advertiser whom we had been endeavoring to convince that advertising in our paper would be productive of business, told us the tale as he signed up for a page advertisement in our journal."

Then our friend told us the story of a motor truck advertisement. It was only a quarter-page advertisement, but it brought a sale of a motor truck despite the fact that other dealers had their representatives right on the ground to talk personally with the buyer—figure up the costs of these two methods of salesmanship.

The paper which this editor represents is one young in years, but it has developed a strong following and its readers are loyal to it—a fact which concerns that had been solicited for advertising had not realized, among them a large motor truck company. There was only one motor truck advertisement in this journal at that time, although many others had been asked to utilize its pages.

One of its readers was about to purchase a motor truck, and one which would cost considerable, as the man wanted it for a specific purpose. He found the one advertisement in his favorite trade paper and then he sent for information. Other motor truck men learned he was in the market and sent their salesmen to see them. But they were told that their truck was not advertised in the trade paper which he thought was the best in the field—therefore he would buy the truck the manufacturer of which supported his paper.

The moral which the large motor truck company drew from the incident was this: "It pays to advertise—every issue. The time the ad drops out is the time the buyer drops in."

There are many concerns receiving business from the Independent telephone field which have been invited to advertise in TELEPHONY but have not accepted. We wonder if they will not eventually encounter loyal TELEPHONY readers who will stand by those manufacturers who present the merit of their goods through its advertising columns. The Independent field is rapidly learning the lessons of co-operation—of sticking together and "hopping to it." It is beginning to realize that it is a stable industry in the building up of which TELEPHONY has been influential in no small degree.

For a Successful War.

The Independent telephone field has raised several field battalions for the United States Signal Corps Reserve. Men and officers are now called to service and are assembled at various cantonments for training before going to the front.

There are many who, for various reasons, have been obliged to stay at home. The opportunity to back up their representatives—the men at the cantonments and later in the field—is at hand. The second issue of Liberty Bonds is now offered for subscription. Its success will help greatly to bring the war to a successful termination. The Independent telephone men will do their duty—subscribe for Liberty Bonds.

Interference From Induction

General Principles of Circuit Balance—Method of Checking Circuits for Mutual Balance—Development of System for Prevention of Cross Talk—Balancing Against Foreign Circuits—Reducing Disturbing Influences—First Installment

By E. W. Kellogg

The problem of securing quiet telephone lines divides itself naturally into two parts: First, the prevention of cross talk between the various telephone circuits in the lead; and secondly, the elimination of noises resulting from neighboring power lines.

The nature of the interference is the same in both cases, and the chief remedy —transposition—is the same, but the circumstances and the details differ. The usual plan is to work out a transposition system which will prevent cross talk and then, wherever there is a power circuit parallel, introduce such modifications or substitutions in the telephone transposition system, and such modifications in the power circuit as may be needed.

The principal phases of this subject will be discussed in the following order:

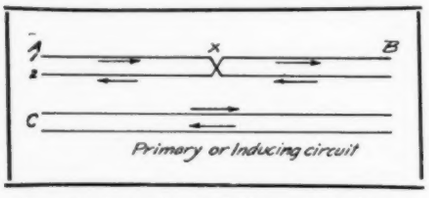

Fig. 1. Balance Against Magnetic Induction.

1. General principles of circuit balance.
2. A method of checking circuits for mutual balance.
3. The development of a system for preventing cross talk.
4. Methods of balancing against foreign circuits.
5. Methods of reducing the disturbing influence.

Circuit Balance.

If the current in circuit *C*, Fig. 1, is increasing in the direction indicated, the lines of magnetic force interlinking with circuit 1-2 would set up electromotive forces in the directions shown. But if

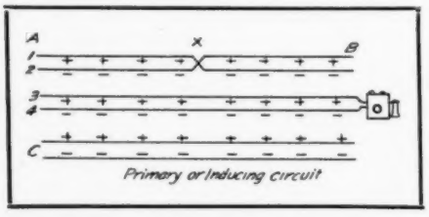

Fig. 2. Effects of Electrostatic Induction.

the exposure is uniform throughout the distance *A-B* and the transposition is at the middle of this section, the electromotive forces in *X-B* will neutralize those in *A-X*, and there will be no tendency for current to flow through telephones connected to the ends of the circuit.

In Fig. 2, circuit *C* would induce charges on wires 1, 2, 3, and 4, as shown,

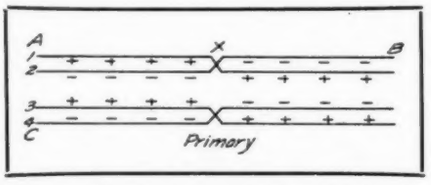

Fig. 3. Effect of Transposing Both Circuits

and when the charges reverse in circuit *C*, they will reverse in 1 and 2 and in 3 and 4. To reverse in circuit 3-4, which is not transposed, the charges must pass through the telephones at the ends of the circuit, but in 1-2 the charges can reverse without passing through the telephones, and therefore the noises will be avoided. Thus the transposition balances the lines against both electromagnetic and electrostatic disturbances.

If circuit *C*, Fig. 3, is charged as indicated, the induced charges will be positive (+) on wire No. 1 and negative (—) on wire No. 2 throughout, or the effect is the same as though neither circuit had been transposed. In other words, two or more circuits may be transposed at the same point without altering their relations.

A disturbing line not only causes interchange of charges between the two wires of a neighboring telephone circuit, which effect is called *transverse induction*, but in many cases causes the potential of both wires to rise and fall with respect to ground. The last-named effect is called *longitudinal induction*. It cannot be prevented by transposing the telephone circuit, but can in many cases be largely reduced by transposing the power circuit.

Longitudinal induction does not necessarily cause noise unless one wire of the telephone circuit is grounded or poorly insulated. Fig. 4 illustrates such a condition. As the potential on the disturbing line, *C*, alternates, some charging current flows through the leak from ground to wire No. 2 and back. The charges tend to distribute themselves on both wires, but in getting from wire No. 2 to No. 1 they must pass through the telephones at the ends and cause noise. This trouble disappears if the leakages from the two wires to earth are equal, or else if both have such high insulation resistance that the leakage current is negligible.

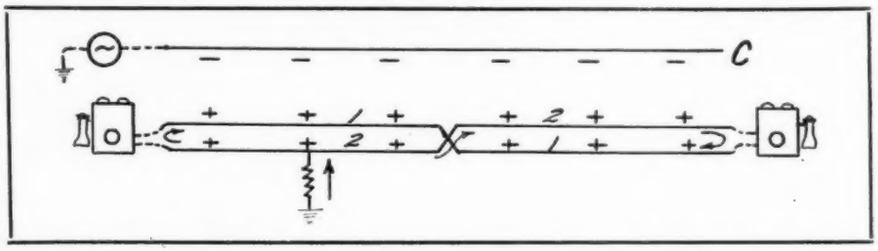

Fig. 4. Unbalance in Insulation Will Cause Noise.

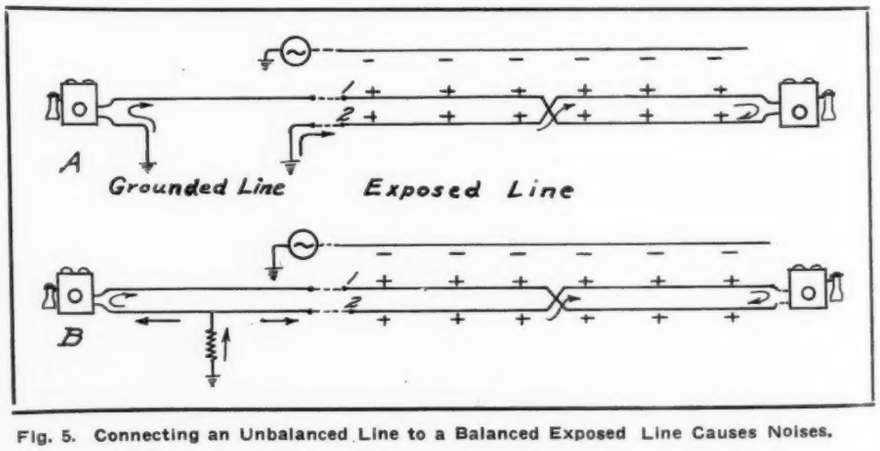

Fig. 5. Connecting an Unbalanced Line to a Balanced Exposed Line Causes Noises.

The leak or ground may be on some other circuit to which the exposed line is connected, and noise will result. Fig. 5-*A* shows a transposed line subject to the fields from a disturbing wire, and connected to a grounded local line.

Prior to the connection both lines were quiet, but as soon as the connection is made, the grounded line begins to supply charging current to the exposed line. Wire No. 2 receives its charging current directly, but wire No. 1 can receive its charges only through the telephones at the ends of the circuit. The same thing occurs when an exposed but balanced line is connected with another line, the two wires of which are not equally insulated, as indicated in Fig. 5-*B*.

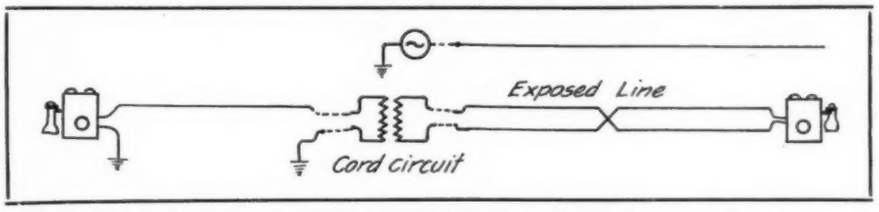

Fig. 6. A Repeating Coil Is Remedy for Conditions Shown in Fig. 5.

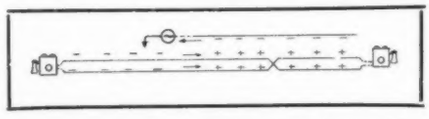

Fig. 7. Transfer of Charges Between Exposed and Unexposed Lines.

A repeating coil which insulates the lines from each other, thus preventing the grounded line from supplying charging current to the exposed line, eliminates noise, if the noise is the result of connecting together lines which are quiet when separate. The coil is generally placed in the cord circuit as shown in Fig. 6. Coils for this purpose should have low capacity between windings.

Inequality in the impedance of the two conductors, resulting from bad joints, or from apparatus connected in one side only, may result in noise. When the disturbing wire in Fig. 7 is negative with respect to ground, it will draw positive charges to the exposed end of the telephone circuit, leaving the unexposed portion negative.

This results in currents between the two parts of the circuit, but if the resistance of the two wires are equal there is no noise. On the other hand, if one wire has considerably more resistance than the other, a part of the charging current which it should carry is diverted around through the other wire and incidentally through the telephones, as indicated in Fig. 8.

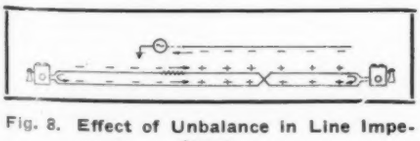

Fig. 8. Effect of Unbalance in Line Impedance.

The insertion of a repeating coil will sometimes reduce noise resulting from the conditions just described, but the proper cure is to eliminate the bad joints or apparatus responsible for the unbalance.

Well-designed switchboard circuits are arranged so that the series impedances in the two wires are equal. If a ground connection is made, the two conductors are symmetrically placed with respect to ground so that the impedance from line to ground is the same on either side, as shown in Fig. 9. An apparent exception to this rule of symmetry is the fact that one line is connected to the grounded and the other to the undergrounded side of the battery, but the battery presents a negligible impedance to high frequency currents.

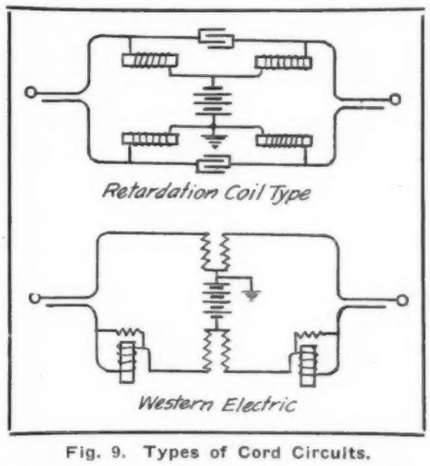

Fig. 9. Types of Cord Circuits.

The supervisory relay in the Western Electric cord is in series with one conductor, but this relay is of such low resistance that it causes no trouble.

Checking Transposition Systems.

Fig. 10-*A* shows three transposed circuits. We may think of a transposition as simply turning a circuit the other side up. Looking at it this way, circuit No. 1 is one side up from *a* to *c* and *g* to *i*, and the other side up from *c* to *g*.

The relation can be conveniently shown by representing each circuit by a line drawn with colored ink or by a dotted line as shown in Fig. 10-*B* with an *x* for each transposition. Every other section is then blackened as shown in Fig. 10-*C*. Now wherever a circuit appears dotted it is one side up, and wherever it appears black it is the other side up.

For two circuits to be non-interfering, the total distance for which they are alike—both dotted or both black—must equal the total distance for which they are opposite (one dotted and the other black). The transposition points in Fig. 10-*C* are so located that the total distance is divided into eight equal sections. Checking circuit No. 1 against circuit No. 2, we find them alike in section a-b, opposite in section b-c, like in section c-d, and opposite in section d-e.

This is recorded in Fig. 10-*D*, in which a + sign is entered in each section in which the circuits are alike, and a — sign in each section in which they are opposite. Since in each of the three combinations of circuits, 1-2, 1-3, and 2-3, the number of + sections is equal to the number of — sections, the circuits are non-interfering.

It is not usually necessary to put down the complete record of exposures as is done in Fig. 10-*D*, for the line may be broken up into several parts in each of which there is a balance. This is simply a way of pairing off the + and — sections. Fig. 10-*D* shows that in checking circuit No. 1 against No. 2, there is a balance in each quarter of the total length. This is also true of circuit No. 2 against No. 3, while there is balance between circuit No. 1 and No. 3 in the first half of the total distance, and again in the second half.

To further expedite the work of checking, it is worth while to become familiar with four fundamental types of non-interfering circuits, so that they will be recognized at once. These types are shown in Fig. 11. It is now necessary to divide the total distance in Fig. 10-*C* into two parts only, instead of four. Taking either half by itself, the left half for example, we notice that circuit No. 3 is type *a* (of Fig. 11), circuit No. 2 is type *c*, and circuit No. 1 is type *b*. It follows that there will be no interference between these circuits.

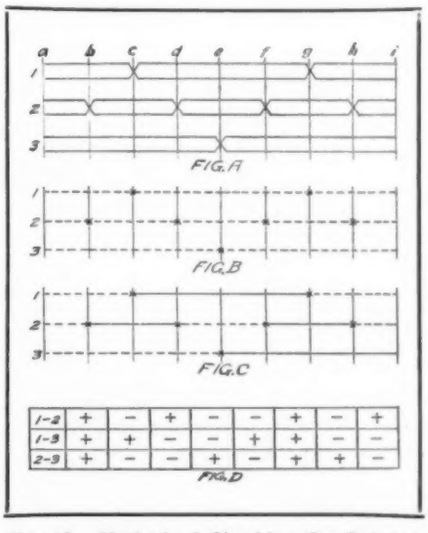

Fig. 10. Method of Checking for Balance.

The introduction of phantom circuits adds considerable complication to the process of checking, but the same gen-

eral principles and methods apply. It is necessary to see that the phantom circuit does not interfere with any other phantom nor with any of the physical circuits, including its own side circuits. Cutting in the phantom transpositions also complicates the problem of preventing interference between the physical circuits.

Fig. 12 shows a transposition layout

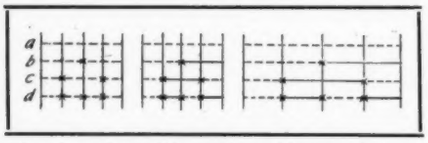

Fig. 11. Four Elementary Types of Non-Interfering Circuits.

for a ten-pin arm. A convenient form for recording the results of checking is shown in Fig. 13. As each circuit is

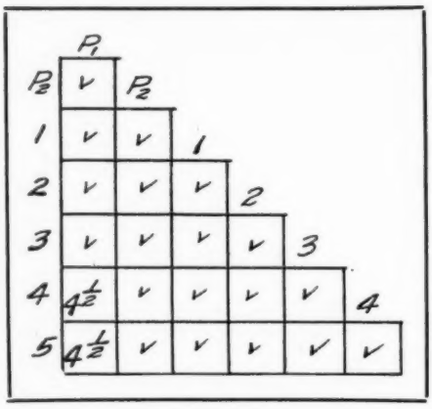

Fig. 13. Interference Table for Fig. 12.

tested against each other circuit, a check mark is made in the corresponding square, or if interference is found, this is indicated. Circuits No. 1 and No. 2 considered by sections *ac*, *ce*, *eg*, and *gi*, are of types *b* and *c* of Fig. 11 and are therefore non-interfering.

Circuits No. 1 and No. 3 are alike (+ exposure) from *a* to *c*, and opposite (— exposure) from *c* to *e*, while to the right of *e* they are of mutually non-interfering types. It is necessary for circuit No. 1 to be completely balanced against No. 3 within the distance *a-e* and again within the distance *e-i*. In other words, a + exposure to the left of *c*, could not be offset by a — exposure to the right of point *c*, since the separation of the circuits is different in the two cases.

Similarly the — exposure between circuits Nos. 3 and 4 in the section *b-d*, must be offset by a + exposure in the section *f-h*, which is the only other place where the separation is the same. In checking a side circuit of one phantom against the side of another, as for example circuit No. 1 against No. 4, they must be tested for each of the four possible combinations of positions, namely:

No. 1 in its upper position as it appears in the diagram Fig. 12, and No. 4 also up, which occurs in sections *a-b*, and *d-e*.

No. 1 up and No. 4 down, which occurs in sections *b-c*, and *c-d*.

No. 1 down and No. 4 up, which occurs in sections *e-f*, and *h-i*.

No. 1 down and No. 4 down, which occurs in sections *f-g*, and *g-h*.

It will be observed on reference to Fig. 12, that there is complete balance within each of these four positions.

When both circuits, for example No. 1 and No. 4, are in their upper positions, the separation is the same as when both are down, so that in reality there are only three different positions for which there must be separate balance. It is not always easy however, to take advantage of this fact, so the general aim should be to obtain balance in each of the four positions.

Fig. 14 shows a case in which an exposure with both circuits up is offset by an opposite exposure with both circuits down.

The two physical circuits which form

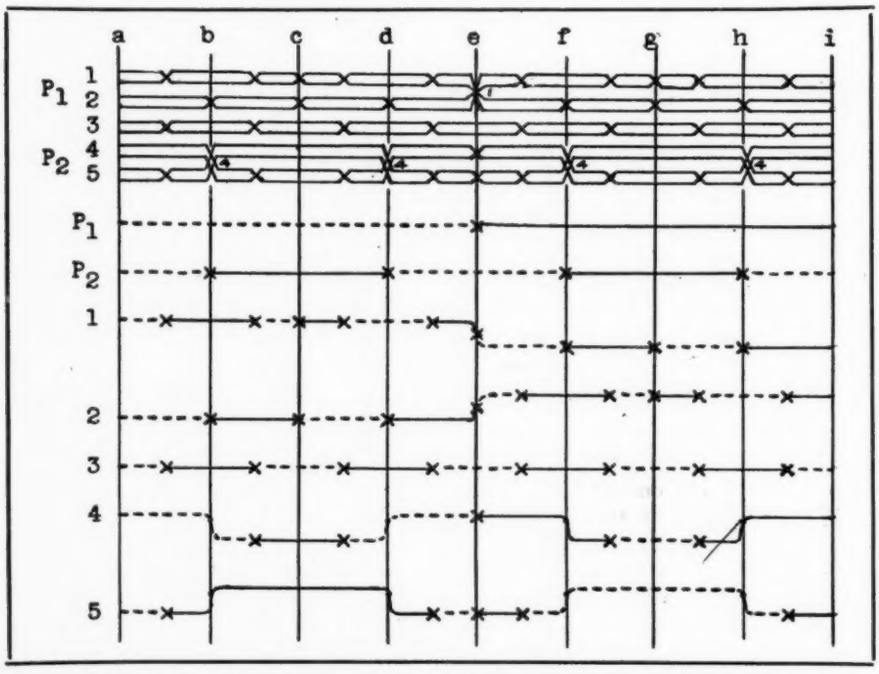

Fig. 12. Example of Transposition Layout with Phantoms (Defective, See Fig. 21).

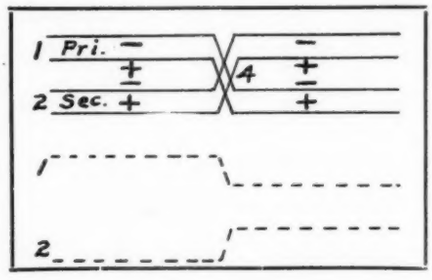

Fig. 15. A Type 4 Phantom Transposition Does Not Balance Side Circuits.

the sides of one phantom, have a uniform separation, so that the question of varying distances is eliminated. In Fig. 15, circuit No. 1 is taken as the primary or inducing circuit, and the charges shown on the wires of circuit No. 2 are induced.

It will be observed that with a type No. 4 phantom transposition as shown, the

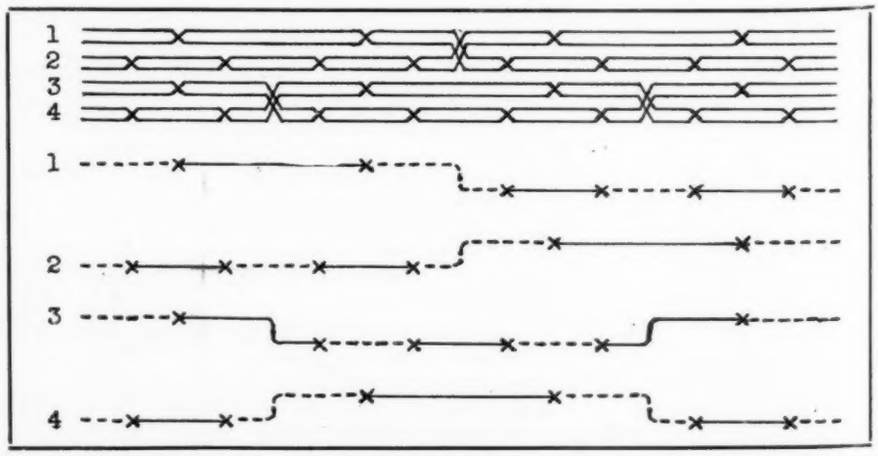

Fig. 14. Exposure when both Circuits Are Up—Balanced against Exposure when both Circuits Are Down.

exposure is of the same sign to the right of the phantom transposition as to the left. Since the separation is also the same, the intensity as well as the sign of the exposure is the same on either side

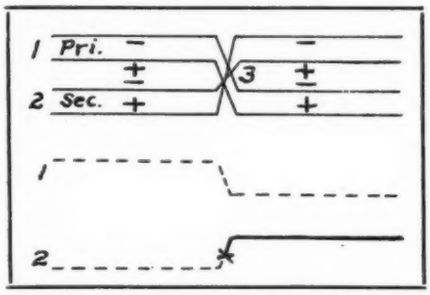

Fig. 16. A Type 2 or 3 Phantom Transposition Balances Side Circuits.

of the transposition. The use of a type No. 2 or No. 3 phantom transposition as shown in Fig. 16 balances the circuits against each other despite the fact that in the exposure chart, lower diagram of Fig. 16, the circuits appear far apart during the + exposure and near together during the — exposure.

If one of the two physical circuits

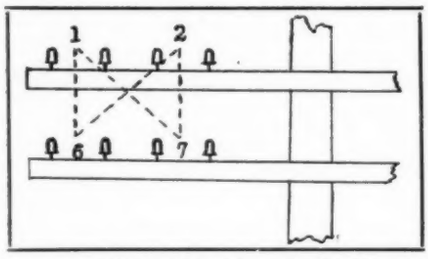

Fig. 17. Relative Positions of Side Circuits in Phantoms One Above the Other.

being tested for mutual interference is in a phantom, and the other is in a second phantom directly below the first, as shown in Fig. 17, there are only two degrees of exposure. The circuits will be either one over the other—in positions 1 and 6 or 2 and 7—or else they will be in the diagonal relation—in positions 1 and 7, or 2 and 6.

In Fig. 18 the upper circuit is considered as carrying charges due to voice

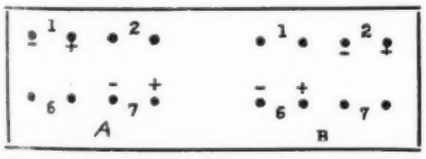

Fig. 18. Induction Between Circuits Nos. 1 and 7 is of Same Sign as Between Nos. 2 and 6.

currents, and the induced charges on the lower wires are shown. It is seen that the sign of the exposure is the same when the upper circuit is to the left and the lower circuit to the right, as it is when the upper circuit is on the right and the lower circuit on the left. In other words, the exposure is the same when the two circuits appear farthest apart in the exposure chart of Fig. 19, as when they appear close together, or the same in section *bc* as in section *de*.

The exposure is likewise the same when both circuits are up (section *ab*) as when both circuits are down (section *cd*), since in these sections one circuit is directly over the other. Fig. 20 shows a set of physical transpositions for the circuits shown in Fig. 19, in which exposures in section *ab* are balanced against those in *cd*, and exposures in *bc* against those in *de*. It is not very often, however, that advantage is taken of this equality of exposures when circuits are in opposite diagonal relations, since the induction between two circuits, one of which is diagonally above the other, is very feeble, and unbalance here may be permitted for the sake of obtaining balance against other circuits where the induction is stronger.

In checking a physical circuit against a phantom, there will be two degrees of exposure to consider if the physical circuit is a part of a second phantom, not directly above or below the first, or only one degree if the physical is not in a phantom, or is in a phantom directly under or over the first. Thus in Fig. 12 circuit

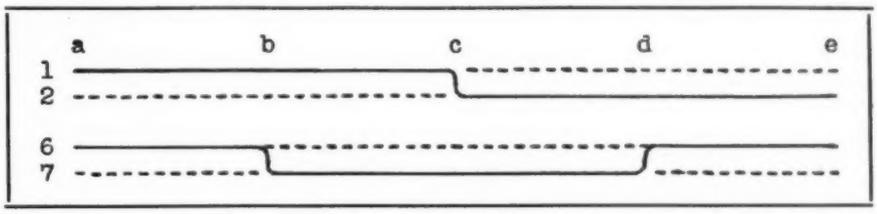

Fig. 19. Exposure in Section b-c the Same as in d-c If Phantom 6-7 Is Directly under 1-2.

No. 4 is separated from the center line of phantom P_1, by one distance in sections *ab*, *df* and *hi*, and by a greater distance in sections *bd* and *fh*, while circuit No. 3

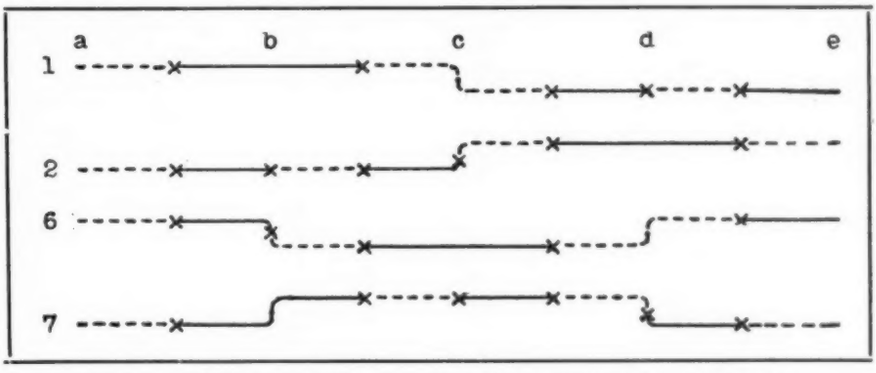

Fig. 20. Possible Layout where One Phantom Is Directly below the Other.

which is not part of a phantom, is at a constant distance from the center line of the phantom.

Between a phantom circuit and one of

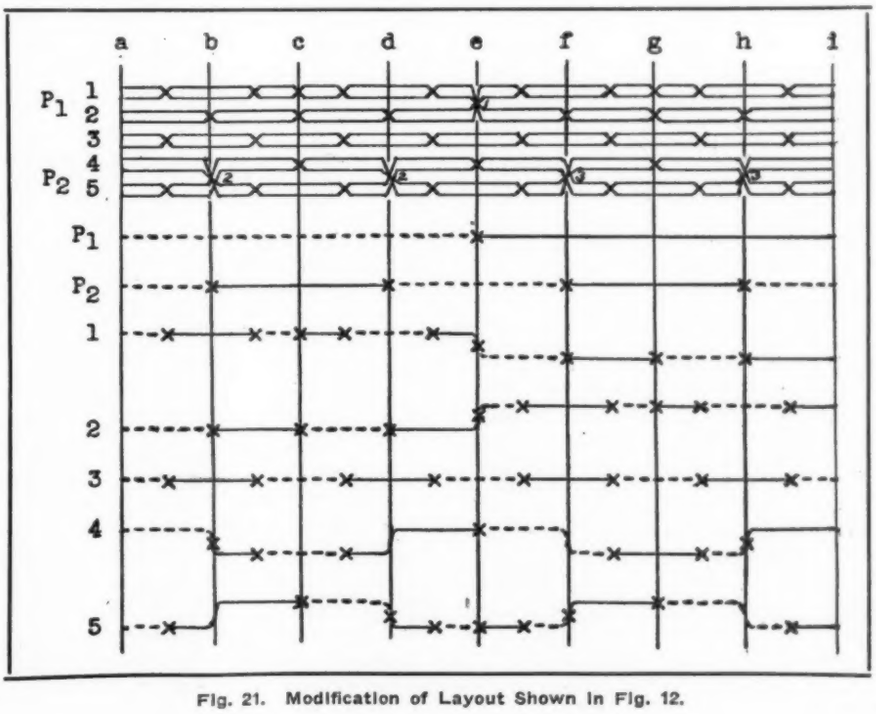

Fig. 21. Modification of Layout Shown in Fig. 12.

its own side circuits there is only one degree of exposure. The sign of the exposure is reversed by a transposition in either the phantom or the physical circuit, but is left unchanged if they are both transposed as by a type No. 1 phantom transposition.

In drawing the exposure chart line which represents the phantom, no attention is paid to the type of phantom transposition, since the type determines not whether the phantom is transposed, but whether the physicals are transposed at this point, and account is taken of this in the lines which represent the physicals. The checking of a physical circuit against a phantom is done in exactly the same manner as the checking of two physicals.

On carrying out the checking process for the layout shown in Fig. 12, we find that while there are no interferences between the various physical circuits, there is a serious unbalance between circuit No. 4 and phantom P_1, and also between circuit No. 5 and phantom P_1.

Since the exposure indicated in Fig. 12 would be sufficient to cause objectionable cross talk, a modification in circuits Nos. 4 and 5 will be tried. Transpositions will be cut into No. 4 at *b* and *h* and in No. 5 at *c*, *d*, *f*, and *g*. The revised plan is shown in Fig. 21. While this has eliminated interference between the phantoms and physicals, it has resulted in the following new interferences between physicals:

No. 1 with No. 4 in sections *cf* and *hi*. No. 1 with No. 5 in section *fh*. No. 2 with No. 4 in sections *ab* and *de*. No. 2 with No. 5 in section *bd*.

In each case, the length of the exposure is one-fourth of the total, and the interfering circuits occupy positions Nos. 2 and 4. That is to say, circuit No. 1 interferes with No. 5 where No. 1 occupies the position originally held by No. 2, and No. 5 is in the position originally occupied by No. 4. This is indicated in the

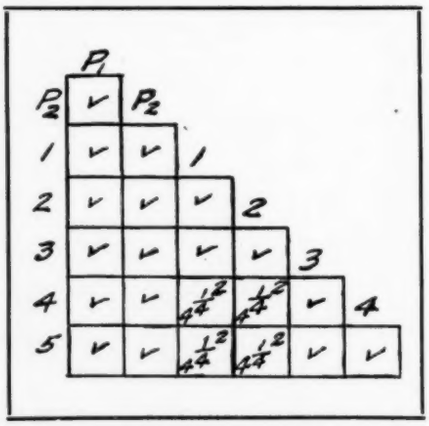

Fig. 22. Interference Table for Fig. 21.

exposure record, Fig. 22, by entering a figure to show the length of the exposure as a fraction of the total length and two small figures to show the positions of the interfering circuits. It is important to record these items since they make it possible to estimate how strong the induction will be.

The interference in Fig. 21 is considerably less severe than in Fig. 12, in the

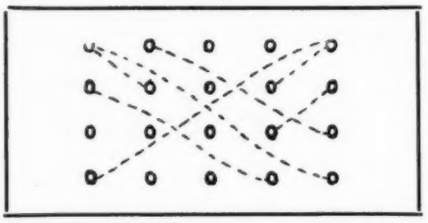

Fig. 23. Exposure Chart for the 4-Arm Lead Shown in Fig. 31.

first place because the physical circuits are less sensitive to external influence than the phantoms, and in the second place because, as now arranged, no exposure exceeds one-fourth of the total distance, whereas in Fig. 12 the exposures were for half the total length.

Where phantoms are employed, it is not usually feasible to construct a transposition system entirely free from cross-talk exposure, but the exposures must be confined to circuits in such relative positions that the induction will be as feeble as possible. After a layout has been checked and the exposures recorded in a table such as that in Fig. 22, it is well to make a sketch like that in Fig. 23, on which each exposure is indicated by a line drawn from one circuit to the other. This shows at a glance the relative positions of the interfering circuits. It is frequently possible from a diagram of this kind, to see where, by a slight rearrangement, the separation of some of the interfering circuits can be increased and the interference reduced.

(*To be continued.*)

Operator Brings Damage Suit for Infection in Her Ear.

Miss Gertrude E. Young has sued the Nebraska Telephone Co. in the Douglas county court for $15,000 damages. She avers in her petition that she contracted frequent and continuous colds while employed as an operator at the information desk. She says there was a draft caused by an electric fan overhead and doors and windows, which were left open. According to her petition an infection set in which probably will result in total and permanent deafness.

Annual Report of Lincoln (Neb.) Telephone & Telegraph Co.

The Lincoln Telephone & Telegraph Co., the largest Independent company in Nebraska, which is headed by Frank H. Woods, former president and now a director of the United States Independent Telephone Association, has filed with the state railway commission its annual report for the year ending June 30, 1917. This shows gross revenues of nearly a million and a half dollars, and a net income of $390,000. The company now operates 99 exchanges in 22 counties in Nebraska, to which are attached more than 55,000 telephones.

The report shows that of the $2,500,000 of authorized common stock there has been issued $1,838,087, and of the $7,600,000 of preferred $3,959,506. The latter issue is nearly all made up of 5 per cent. stock, while the company has been paying quarterly dividends at the rate of 7 per cent. a year on the common. A funded debt of $1,201,000, drawing 5 per cent., is a fixed charge. The fixed capital of the company totals $6,906,687, made up of the following:

Lands and buildings	$ 290,439
Central office equipment	735,226
Station equipment	945,855
Exchange lines	3,178,188
Toll lines	1,661,669
Intangible capital	7,522
Right of way	4,341
Other plant	3,699
General equipment	79,749

The items of construction work now in progress, $23,103; investment securities, $37,155, and miscellaneous investments, $89,917, bring the total permanent and long-term investment up to $7,056,862. The total assets are $8,122,165, made up, in addition to the items above enumerated, of working assets consisting of cash on deposit, bills and accounts receivable and material and supplies.

The liabilities are listed as follows:

Common stock	$1,838,087
Preferred stock	3,959,506
Funded debt	1,201,000
Liabilities not due	119,749
Accounts payable	45,098
Deferred credit items	51,515
Reserve for accrued depreciation	392,292
Undivided profits	34,372
Surplus	472,656
Insurance and casualty reserve	7,890
Total	$8,122,165

This includes $51,515 held for the benefit of the employes' fund.

The operating revenues of the company for the year totalled $1,489,523, the principal items of which were: Exchange service revenue, $1,030,452 and toll, $451,018. The operating expenses were $959,815, leaving a net from operation of $529,736.

Deducting uncollectible revenues of $9,000 and $69,516 taxes paid, the total operating income was $451,220. Non-operating revenue totaled $25,601. From the gross of $476,821 there was deducted a total of $86,023, including $60,000 for interest, leaving the net, $390,798. This was disposed of as follows: Paid out in dividends, $322,436; sinking and other reserve funds, $40,000; surplus, $28,361.

The operating expenses of $959,815 were divided among these general heads: Maintenance, $552,557; traffic, $234,304; commercial, $110,535; miscellaneous, $62,419.

Fundamental Principles of the Telephone Business

A Reading Course Designed to Present Logically the Principles Which Underlie Successful Organization and Operation of Telephone Properties—Prepared Under the General Supervision of Stanley R. Edwards—This Section, "Part VI, The Valuation of Telephone Properties," Written by Chas. W. McKay

Quiz Questions on the Preceding Installment.

299. Present some arguments upholding the contention that land depreciates.

300. Explain briefly the theory of the valuation of land according to the present value of contiguous property.

301. What is the argument for taking land at its appreciated value when other physical property is taken at its depreciated value? Present an illustration of the treatment of depreciation.

302. What are some objections to the theory of appreciation of land? Discuss the question as to whether or not the appreciation of property is not, after all, equal to a real income.

303. What answer is made to the objection that increase in land values is not definite—that it is uncertain and intangible? Is the theory of land appreciation logical?

CHAPTER XVIII. Depreciation (Continued).

304. *Factors in Determination of Life of Exchange Buildings.*—The life of a telephone building is very difficult to determine. It depends upon several factors—the type of building, the quality of workmanship used in its construction, and the use to which the building is put. Broadly speaking, the peculiar type of buildings used in telephone work have an extremely wide range of life.

As in the case of most of the other plant items heretofore discussed, functional depreciation plays a very important part in the determination of the annual rate of depreciation for telephone buildings. In all probability the life of the latest and most approved type of concrete building is indeterminable—from the data available at the present time. It may last 75 or 100 years, or more. No telephone appraiser, however, would be warranted in assuming a life of 75 or 100 years for even the latest type of fireproof construction—functional depreciation plays too important a part in the problem.

Rapid development in the community served by a telephone building may necessitate radical changes and enlargements so that the general characteristics of a building may be so changed within 10 or 15 years that the architect who designed the building would not recognize it himself.

Then again, there is always the possibility, at least in the larger towns and cities, that a telephone building may have to be abandoned entirely to make way for some new scheme of distribution, necessitated by the community's growth. As an illustration, a telephone building constructed in the far West some 15 or 20 years ago is now standing idle and rapidly falling into decay. A change in local requirements necessitated the abandonment of this building some years ago. Inasmuch as it is located in a high-class residential district at some distance from the railroads, it is entirely unsuitable for manufacturing purposes and it is too far removed from the commercial district to be available for store or office use. Therefore, although the land is of some value, the building itself has become a liability rather than an asset to the company, for the company is obliged to pay taxes on it and to make some maintenance expenditures.

On the other hand, the value of telephone buildings may, in rare instances, increase. For instance, a few years ago a telephone company put up a rather inexpensive building on a parcel of land located in a rapidly-growing residential

Type of Plant.	Life in Years					Net Salvage—Per Cent. of First Cost.					Yearly Depreciation—Per Cent.				
	State A.	State B.	State C.	Composite, Three States.	Allowance Made by Chief Engr.	State A.	State B.	State C.	Composite, Three States.	Allowance Made by Chief Engr.	State A.	State B.	State C.	Composite, Three States.	Allowance Made by Chief Engr.
Exchange pole line	10.0	12.0	10.0	10.4	12.0	0	0	0	0	0	10.0	8.3	10.0	9.6	8.3
Exchange distributing wire	6.5	5.0	6.3	6.1	6.0	0	0	0	0	0	15.4	20.0	16.0	16.5	16.6
Exchange bare wire	6.5	7.0	8.7	7.1	8.0	—16.0	—15.0	— 5.7	—13.0	—15.0	17.8	16.5	12.2	15.9	14.4
Exchange wire composite	6.5	6.3	7.4	6.7	7.2	— 9.4	—10.7	— 3.2	— 8.0	— 9.2	16.8	17.5	13.9	16.2	15.2
Exchange aerial cable	12.0	12.0	12.0	12.0	12.0	30.0	20.0	33.0	28.0	28.0	5.8	6.7	5.6	6.0	6.0
Exchange U. G. main cable	20.0	20.0	16.0	18.2	20.0	40.0	35.0	38.0	38.0	38.0	3.0	3.2	3.9	3.4	3.1
Exchange subs. cable	13.0	15.0	10.0	12.2	13.0	25.0	30.0	30.0	28.1	28.0	5.8	4.7	7.0	5.9	5.5
Exchange U. G. cable composite	23.6	18.3	13.6	16.1	17.4	36.2	33.8	36.0	35.5	35.5	2.7	3.6	4.7	4.0	3.7
Exchange U. G. main conduit	45.0	45.0	50.0	47.6	45.0	0	0	0	0	0	2.2	2.2	2.0	2.1	2.2
Exchange subs. conduit	15.0	20.0	15.0	16.1	16.0	0	0	0	0	0	6.7	5.0	6.7	6.2	6.2
Exchange conduit composite	37.0	40.0	38.5	38.5	37.0	0	0	0	0	0	2.7	2.5	2.6	2.6	2.7
Exchange submarine cable	10.0	....	....	10.0	10.0	0	....	....	0	0	10.0	....	....	10.0	10.0
Exchange right of way	20.0	15.0	20.0	18.2	18.0	0	0	0	0	0	5.0	6.7	5.0	5.5	5.6
Exchange land	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Exchange flameproof buildings	....	....	24.0	....	....	....	....	35.0	....	....	....	....	2.7	....	....
Exchange non-flameproof buildings	....	....	15.0	....	....	....	....	35.0	....	....	....	....	4.3	....	....
Exchange buildings composite	20.0	20.0	22.4	20.3	20.0	50.0	30.0	35.0	41.0	40.0	2.5	3.5	2.9	2.9	3.0
Exchange C. O. equipment	9.0	8.0	10.0	9.1	10.0	20.0	20.0	15.0	18.3	20.0	8.9	10.0	8.5	9.1	8.0
Exchange S. S. E. apparatus	9.0	5.0	9.0	7.4	8.0	10.0	10.0	12.0	10.6	10.0	10.0	18.0	9.8	12.1	11.2
Exchange S. S. E. installation	9.0	10.0	7.0	8.6	7.0	0	0	0	0	0	11.1	10.0	14.3	11.7	14.3
Exchange station equipment composite	9.0	6.0	8.2	7.7	7.7	7.0	7.0	8.4	7.4	7.0	10.3	15.6	11.1	12.0	12.1
Toll poles	16.0	16.0	15.0	15.6	16.0	0	0	0	0	0	6.3	6.3	6.7	6.4	6.2
Toll aerial cable	12.0	10.0	13.0	10.8	12.0	30.0	10.0	25.0	19.8	28.0	5.8	9.0	5.8	7.4	6.0
Toll copper wire	30.0	28.0	30.0	28.9	30.0	35.0	35.0	40.0	36.4	35.0	2.2	2.3	2.0	2.2	2.2
Toll iron wire	10.0	12.0	10.0	10.6	10.0	—19.0	—20.0	0	—14.3	—15.0	11.9	10.0	10.0	10.8	11.5
Toll wire composite	20.6	23.4	23.0	22.2	22.1	27.8	29.9	35.8	31.3	29.4	3.5	3.0	2.8	3.1	3.2
Toll conduit	45.0	45.0	50.0	47.6	45.0	0	0	0	0	0	2.2	2.3	2.0	2.1	2.2
Toll U. G. cable	20.0	25.0	20.0	21.0	20.0	40.0	35.0	40.0	38.6	38.0	3.0	2.6	3.0	2.9	3.1
Toll submarine cable	10.0	10.0	....	10.0	10.0	0	0	....	0	0	10.0	10.0	....	10.0	10.0
Toll right of way	25.0	30.0	25.0	27.0	30.0	0	0	0	0	0	4.0	3.3	4.0	3.7	3.3

Table XXXVIII.—Determination of Annual Depreciation for a Large Company in the Middle West.

district. While, of course, the building itself did not increase in value, the land increased so rapidly that a few years later the company found it to its advantage to sell the property at a price far in excess of the original cost.

The company was able to transfer its office site to a point a few blocks distant and thus make a handsome profit on its original real estate investment. Of course, the increment in value in this case was primarily due to the rise in land values. However, it happened that the building in question was so constructed that the purchasers of the property actually offered a higher price for the property than they would have if the building had not been there. The building was subsequently converted into a two-family residence.

305. *Life, Salvage Value and Yearly Depreciation of Exchange Buildings.*—Obviously the problem of determining the life of telephone buildings, in years, the salvage values, and the yearly depreciation rate proved somewhat perplexing to the company whose depreciation table is under discussion. It will be noted that no figures have been given for states A and B for the items "flameproof buildings" and "non-flameproof buildings," respectively. However, a complete set of figures is given for telephone buildings of all classes. The engineering department has determined upon a life of 20 years, a salvage value of 40 per cent. and an annual depreciation rate of 3 per cent. as being reasonable for the property as a whole.

Undoubtedly an average life of 20 years for the buildings owned by a telephone company which covers a rather extensive area—and probably owns buildings of all types—is entirely within reason. The salvage value of 40 per cent., however, seems somewhat high. Ordinarily, even with the prevalent high prices for second hand material, a salvage value of 25 per cent. or 30 per cent. is plenty high enough.

306. *Life of Telephone Switchboards.*—In determining the average life of exchange central office equipment, we are again confronted with the factor of functional depreciation. A prominent telephone engineer once said that the best rule he knew of for determining the life of telephone central office equipment was to "take your longest guess and add 10 years to it."

This engineer undoubtedly referred to the life of central office equipment as governed by physical depreciation alone. For instance, the way in which an old-fashioned magneto telephone board will hang together and give service long after it has theoretically reached the end of its useful life, is astounding. Anyone who has the good fortune, or ill fortune, of operating one of these boards over a long period, will agree to this statement.

The life of a telephone switchboard as based on physical causes is a factor of minor importance in the determination of its actual life. Undoubtedly many of the multiple magneto switchboards installed in New York City would still be in service if their period of usefulness had been determined by physical depreciation alone. The telephone art is advancing so rapidly and the individual requirements of telephone central office districts change so quickly, that physical depreciation plays a comparatively small part in the problem of determining the average useful life of a modern telephone switchboard.

It would be most interesting to consider the life or history—as regards the telephone switchboard problem—of several of the larger telephone communities during the past 15 or 20 years. In many cases no sooner had a new board been installed than it became necessary to rip it out and install another of a more up-to-date and efficient type.

It will be noted that the average life for the three states, as given in Table XXXVIII, is 9.1 years, while the average life allowed by the engineering depart ment is 10 years. This figure, however, covers more than the switchboard—it covers the central office equipment as a whole.

307. *Central Office Equipment.*—Central office equipment, as we know it, includes the switchboard, the terminal frames, the protective equipment, the power plant and the central office cabling and wiring. Of course, many of these items have a considerably shorter life than the life of the switchboard proper, and this fact tends to materially reduce the average life of central office equipment. Taking all things into consideration, an average life of 10 years for item, "exchange central office equipment," is entirely within reason, for a comparatively large company having in its plant equipment of various types and various makes.

In this connection, it will be noted that although the heading, "Exchange Central Office Equipment," has been used, the equipment here considered includes both exchange and toll central office plant. The reason for this will be apparent when it is remembered that the Interstate Commerce Commission's system of accounts makes no provison for the segregation of exchange and toll central office equipment. The company whose table is under consideration has followed the practice adopted by all telephone companies, of including *toll boards* and *toll equipment* as a part of the *exchange* central office plant.

An average salvage value of 20 per cent. of the first cost, or reproduction cost, has been assigned by the engineering department to the item, "Central Office Equipment," Table XXXVIII. All things considered, this allowance is probably entirely within reason.

There may be, of course, some cases where, with the prevalent high prices of copper and platinum, it may be possible to realize more than 20 per cent. on an individual installation. However, in other cases it is doubtful if anywhere near this amount could be obtained. Therefore, for a large company having a rather varied assortment of central office equipment, a salvage value of 20 per cent. of the reproduction cost is undoubtedly fair.

308. *Subscriber's Station Apparatus.*—Functional depreciation has, in the past, played a very important part in the determination of the life of subscriber station apparatus. The development stage, however, of the art of making telephone instruments is largely over.

During the past few years, wall and desk sets, of both common battery and magneto type, have become so standardized that obsolescence depreciation is becoming less and less of a factor in the problem of determining the life of subscriber's equipment. Of course this statement applies only to plants equipped with modern apparatus and to plants not susceptible to a future change from the magneto to the common battery type of equipment.

Referring again to Table XXXVIII, it will be noted that the average life of station apparatus is given at eight years and the salvage value at 10 per cent. These figures are undoubtedly conservative for a large property containing an appreciable percentage of obsolescent equipment.

(*To be continued.*)

Economy Telephone Co. is Making Improvements.

The Economy Telephone Co. has completed a new trunk line between Confluence and Somerfield, Pa., giving the Yough Valley region much better telephone service.

The company also installed a new 240-line Kellogg switchboard in the Meyersdale exchange, giving that office a capacity of 340 lines. The 100-line switchboard which was installed in the Meyersdale exchange a year ago, was moved to Confluence to take care of the growing business there, and the 50-line switchboard formerly in use at Confluence was moved to Somerfield. One hundred and eight new telephones have been installed by the Economy company during the past year and the list is still growing.

Earnings of the Porto Rico Telephone Co.

The Porto Rico Telephone Co.'s gross earnings for the first five months of 1917 were approximately $125,000 as compared with $93,000 two years ago, an increase of about 34 per cent. in the two years. Net earnings of $71,000 for the period are an increase of over 43 per cent.

More of It

Increasing Costs—A Necktie—Are We Keeping Up?

By J. C. Kelsey

Yesterday I went into a haberdasher's shop. It was a modest little place, devoted only to the vanities and frailties of the masculine sex, and presided over by a meek little man who looked as if he lived in the proverbial band box.

He seemed to be a backward little man, far removed from the clatter and din of commercial warfare. He surely appeared to be one who had fallen or would fall behind the procession of increasing prices. He did not seem to be in the sturdy telephone man's class at all—he did not look able to even dare to face the public.

I wanted a necktie—mine had worn out. It had become inadequate and even seemed to be obsolete. Replacement time had surely come.

A necktie contributes nothing to the material comfort of the world. It offers it no practical advantage. It toils not and does not spin. It tears every time one tries to pull it through a collar and becomes hopelessly mussed the first time it is used. It costs as much as a month's telephone service, and it gets by the public purse without a mumur.

It always gives one a suspicion that a powerful propaganda has lurked behind the necktie trust because the public has become so hopelessly enslaved by this useless and frivolous thing.

The necktie and the telephone company have just one thing in common: Telephone apparatus and material wear out, become inadequate and obsolete, and must be replaced.

They agree possibly in one other thing—the monthly cost of a telephone is equal to, if not less than, the cost of a man's necktie.

But the telephone contributes something very definite to the public. It gives countless advantages. It toils and spins 24 hours a day, and every day of the year. It does not tear every time it is used. It never becomes mussed and ruffled and one does not have to creep apologetically into any store to use it. The telephone is at most men's elbows. Yet for some reason the telephone company has been hopelessly enslaved by the public.

I selected one necktie. It was a skimpy thing—made from the scraps of some fearfully and wonderfully-made garment. It weighed nothing and was worth nothing except possibly the labor of some sweat-shop worker trying to keep soul and body together.

But I could not get one necktie of the variety I picked because the meek and apparently-retiring little man of the band box, distinctly said he would sell no less than three of the kind at a time.

After I recovered, I asked the meek little man what he thought of the proposed readjustment of telephone rates in Chicago—and he said he hoped they would be lowered. I replied that I hoped the Chicago Telephone Co. would refuse to install less than three telephones in one place—but he could not see the point of my joke.

It is a fact that the rates of the Chicago Telephone Co. will be adjusted during the winter and spring. Put the question up to any business man, or any householder, in Chicago, and you will not be surprised to learn that he thinks the telephone company's gross earnings are its net earnings. The average man does not seem to get through his head that it costs anything to operate a telephone company.

He feels that way about the gas company, the electric light company and the street railway, for all are his predatory and hereditary enemies, bent upon ruining him by excessive charges.

Just to illustrate how the public utility gouges the public in a great city covering miles of distance where men can talk over 30 miles of wire on a flat rate and ride as many miles on a comfortable street car, the September bills of a Chicago family of four are presented:

Groceries and meat	$ 75.00
Rent	65.00
Dry goods	60.00
Starting boy to high school	40.00
Doctor	16.00
Club dues	12.50
Milk	8.50
Electric light	6.25
Gas	5.55
Street railway	4.40
Telephone	3.20
Newspapers	1.60
Total	$298.00

These are not all the bills, for the coal man, the cleaner and many other merchants have sent in bills, and not one of them are as low as the telephone, which serves the immense area of a great city. Most of the scattered bills are higher than the electric light, gas, and street railway accounts, and yet they are paid more cheerfully.

It is surely hard to understand why the American public is so penny-wise, and so terribly pound-foolish.

The increase in the grocery and meat bill since 1914 exceeds the total cost of the four utilities, yet that fact is calmly accepted. The increases in the costs of drugs, blankets, sheets, towels, soap, and everything a family uses, will easily overbalance the utility expense so necessary and so convenient.

Who is to blame for this penny-wise and pound-foolish frame of public mind?

It is very well to blame politicians who at times seek election to office through corporation baiting, but the real Senegambian in the woodpile is the utility man himself. Why has he always been in such a humble and apologetic mood, instead of being the roaring lion the public accuses him of being?

We all know that the four-flusher or the dead beat puts on the biggest front and demands the most, and it may possibly explain why the conscientious bill-paying utility always gets the inside room at the public hotel or a back seat in public affection.

The penny-wise and pound foolish public is incapable of appreciating a great dynamo, a large switchboard, an immense gas tank, or a smooth-running swivel-truck street car.

The real reason is that it does not interest them in that it does not amuse them or appeal to their cupidity.

A man on a soap box, wrapping up an occasional five-dollar bill with a dollar bottle of fake medicine, will get more applause and collect more money per dollar of investment, than all the utilities in a lifetime.

A mistake has been made in giving the public credit for wisdom and seriousness which it does not possess.

In Chicago, telephone rates, gas rates and electric light and power rates have been reduced within five years, while the street railways still recognize the nickel as the unit of existence.

All other commodities have gone up and up, even milk has gone up to 13 cents a quart. And when one compares the value of a quart of milk to a quart of beer, he can see that even 25 cents a quart for milk is justifiable.

The milkman is meeting the usual sob-stuff about children and babies, but in the game of self-preservation, he has to include himself. He, too, has children who wear shoes and have to be kept fairly comfortable.

There has been considerable sob-stuff in the public utility line. If the street rail-

ways raise their rates to six cents, it will deprive the poor man who has to ride in street cars, and never affect the man who goes to work behind a chauffeur.

If the gas company wants to increase its rates or even hold them level, the poor family will be deprived and the rich man will not miss it. If the telephone company wants to increase its rates, the usual cry of extortion and oppression of the poor man is raised and trouble begins.

But what happens to the poor man when the smallest loaf of bread he can get costs ten cents, and enough meat to carry him through the day costs him an hour's work. No savior of the people rises to protest.

The telephone company cannot escape the new taxation upon its already-taxed life. The operator who worked so well for so many years at little money, is fast understanding the advantages of her opportunities. The lineman and the troubleman, feeling the high cost of living and the increased labor which he must undertake since his fellow workers have gone to war, are restless. The manager, himself, will have more to do and have more expense and he must have more income or fail to keep up with the procession.

The stockholder, the man who puts his life-long savings into an income-producing investment, in order to round out his years of life comfortably, also has his rights.

There never was a time in history when a great business faced such a crisis and had at the same time such opportunities of equalization.

We complain considerably of the cruelty to Belgium and the violation of international laws on the part of some of the European combatants. We were indignant at the thought expressed by a German official that Argentine ships should be sunk so that no trace might be left.

Yet it never occurs to us that a corporation which pays no dividends to stockholders, is guilty of exceptional cruelty especially if it is a public utility corporation.

The creation of a law which limited earnings also created one which guaranteed them, and many an investor entrusted his precious money to utilities on this basis. A corporation management, too lazy to act or unwilling to care for its stockholders, comes under the head "Spurlos Versenkt." He who defers dividends or refuses to earn them when he can, sinks the hopes of stockholders so deep that no trace remains.

While the world is fighting for the safety of democracy, the telephone man, and all public utility men for that matter, should give some real thought to the safety of stockholders. It is true that a share of stock holds no guarantees or written promises, but the man is a poor steward who does not feel that a share of stock is as sacred as a bond of equal value.

I have always accused business men of being the authors of crooked politics and cruel industrial outrages, but it seems, at least, that the policy of sinking a ship without leaving a trace has its origin, not in the mind of a predatory corporation, but in the mind of a preacher.

It seems that William Penn was on his way to America with a group of Quakers and the thought of it made the religious Cotton Mather a little bit peevish. So he called a meeting of the board of trustees of that little New England church, and before the meeting closed they had decided to "Spurlos Versenkt" the amiable Penn and sell him into slavery.

Thus it seems that the practice of maltreating a competitor or of using unfair methods began about 1682, and laid the foundation for so many predatory modern industrial groups which believed in monopoly.

It reminds one of a much-advertised cry of "one policy and one system" on the part of the New England section of the telephone business. This very war in Europe, today, is nothing but a protest aginst "one policy and one system"—that of imperialism and monopoly are the same thing.

It seems quite absurd to think that after the world has settled the question of one policy on a world scale, it is going to tolerate a state or a national system of the same evil thing.

It is difficult to believe that we will ever again see an attempt at "Spurlos Versenkt" in the telephone business such as was originated in 1907 when the Western Electric Co., with a monopoly of the Bell business set out to sink the Independent telephone manufacturers without leaving a trace.

We can only hope that the influence of its New England ancestors has died out or its management has realized something of what this world now means—that smaller industries, as well as nations, have rights which must be respected.

Heredity is a wonderful thing and it is well to read a letter written by a New England preacher who openly advertised one religion and one policy

September Ye 15, 1682.

To Ye aged and beloved Mr. John Higginson: There is now at sea a ship called the "Welcome," which has on board an hundred or more of the heretics and malignants called Quakers, with W. Penn, who is the chief scamp, at the head of them.

The general court has accordingly given secret orders to Master Malachi Huscott of the brig "Porpoise" to waylay the said "Welcome" slyly, as near the Cape of Cod as may be, and make captive the said Penn and his ungodly crew, so that the Lord may be glorified and not mocked on the soil of this new country with the heathen worship of these people. Much spoil can be made by selling the whole lot to Barbados, where slaves fetch good prices in rum and sugar, and we shall not only do the Lord great service by punishing the wicked, but we shall make great good for his minister and people.

Master Huscott feels hopeful, and I will set down the news when the ship comes back.

Yours in ye bowels of Christ,
Cotton Mather.

The struggle of the world, the struggles of the nation, the struggle of business, the struggle of the individual, have made us all akin.

In the telephone business, there is really but one policy and one system, and that is, getting a proper return for telephone service. When a telephone man realizes that the New Yorker only pays $30 a year for telephone service, and almost that much for a meal, it is about time to drop any policy which worries anyone.

There should be no argument in the telephone business except that one devised for a proper rate.

If every telephone man set his face to the wall of a proper return, there would be no worry over unfair factory tactics, purchase of non-competing properties, and cut-throat price competition.

The policy of "Spurlos Versenkt" has no place in the telephone dictionary.

If your haberdasher will not sell less than three neckties at a time, make him pay for three telephones.

Surely you remember the old slate at school and the game of tit for tat.

MORAL: Go thou and do likewise.

First American Telephone Line Completed in France.

According to a dispatch from the American field headquarters in France, the first American-built long distance telephone line in France has been completed by the army signal corps of engineers. It connects General Pershing's headquarters with the farthest billets and camps and branches radiate to other villages. It is entirely independent of all the existing lines.

The Americans planted their own poles along the roadsides, dug holes and strung the wires. Except the poles, which were made from French trees, everything for the line was brought from America. The headquarters offices were wired in the same way by the army signal corps, recruited from eastern telephone companies a short time ago. It is said to be a great treat for the officers to be able to take the receiver off the hook and talk through an American instrument instead of the dubious types used on the continent.

Commissions, Courts and Councils

Discussions and Rulings of State Bodies Having Supervision Over Telephone Companies—Decisions of Courts in Matters of Interest to Public Utilities and Actions of City Councils Relative to Franchises, Rates and Service

Attempt to Eliminate Competing Company at Red Cloud, Neb.

War has broken out at Red Cloud, Neb., between the Lincoln Telephone & Telegraph Co. and the Farmers' Independent Telephone Co., a local organization. The Lincoln company purchased five years ago the exchange of the Bell company, while the Farmers' started business ten years ago because of unsatisfactory relations with the Bell. Both operate city exchanges only, the farm lines entering Red Cloud being owned by mutual companies who do all their switching over the Farmers' board. The latter company has no long distance lines, operating short circuits to two or three nearby towns. Under a long time contract the Farmers' company has been allowed to put a line on the toll board in the Lincoln company's exchange.

Paying double price for full service and the inconveniences of a double service have caused business men and residents to suggest to the rival exchanges that they consolidate. The Lincoln company began negotiations with the Farmers' company, but the directors of the latter made up their minds that if there were to be but one company then that company should be the Farmers'.

A meeting of the directors was held on September 29 and it was decided to quietly circulate a petition. This petition sought to bind the signers to take the service only from the Farmers' company at an advanced rate, with the understanding that service would be given from one exchange only. At the present time the Lincoln company has 300 telephones in the city and the Farmers' 225. With the switched lines added the Farmers' is the largest list.

The proposition met with some favor, and when business men suggested that this did not take care of long distance business they were told that the Farmers' had a long time contract with the Lincoln and that it would file suit the following Monday to enjoin the Lincoln company from cutting off toll service through its board.

The move came to the ears of the Lincoln company that night, and Sunday night it blocked the injunction process by cutting out the Farmers' line on its toll board. The company expects further legal proceedings but toll connections have been completely severed. Officers of the Lincoln company say that no proposition of give or take had come from its rival, and that they looked upon the effort quietly made to annex their subscribers as a conspiracy to put them out of business. While they admit the Farmers' company has a contract for toll connections, they insist that they will not furnish the rope by which their rivals can choke them to death.

By forestalling the injunction proceedings, the Lincoln company thinks it has placed itself in a more favorable position, since whatever legal fight is precipitated will be continued with toll connections severed, whereas the long combat it is prepared to wage would have been unavailing if it had been enjoined from cutting them. President Frank H. Woods of the Lincoln company notified the commission when the Glenwood company demanded physical connection of rival exchanges at Pauline that he would fight any such order through the federal courts as well as the state courts, since he did not believe any company could be legally forced to furnish the means for destroying itself.

Secretary Teel of the Farmers' company has called a meeting of stockholders for October 13.

Modification of Order in Monroe Telephone Case Denied.

The Monroe Telephone Co. has lost out once more in its effort to secure from the Nebraska State Railway Commission some recognition of the claim that, as two of its stockholders paid $55,000 for the Albion plant for the purpose of incorporating it in the system, it should be allowed to issue stock for the full amount.

The commission ruled some time ago that all the stock issue that it could permit would be in a sum sufficient to represent the actual cash invested in the Albion plant plus the value of the services of its managers not fully compensated in its beginnings, in this way cutting out the surplus revenues above 6 per cent. a year that the former owners had put back into the plant. The commission held, in effect, that these belonged to the subscribers and that no stock issue could be authorized to cover this surplus, since later adjustment of rates would necessitate taking the amount of this stock into account.

The Monroe company asked for a modification of the order. Affidavits were submitted by the former owners of the Albion plant challenging the correctness of the commission accountant's conclusion that any large surplus revenues had gone into the property. The accountant allowed only $27,000 as the amount that had been contributed to the enterprise in the form of labor and capital, while the former owners swore that the actual cash that had been invested totaled $20,000, to which there should be added $32,000 as the value of the labor and engineering sacrifice of dividends and salaries for years.

The owners of the Monroe company have been anxious to avoid going into court over the controversy, and Alfred Bratt, the president, was willing to waive the effect of the finding of the original application that he was entitled to $12,000 worth of stock for services rendered the Monroe company without compensation for a number of years in order that the amount to be paid in Monroe company stock for the Albion plant be increased. He was one of the two stockholders who paid $55,000 cash for it. He said he thought that as the purchase would bring property worth more than that figure into the Monroe company, when turned over to it later, the commission should recognize it as a contribution of new money put into the Monroe company.

The modification of the order actually amounted to an offer that the Bratts, who control the Monroe company, would be satisfied if the commission would increase the total new stock issue by $10,000. But the commission finds no good reason why it should recede from its former order. This puts it up to the Bratt Brothers to either retain the Albion property, which they own in their own name, and run it as a separate property or to turn it over to the Monroe company, in which they own a major stock interest, and accept in new stock of the Monroe company about $30,000 less than they paid for the Albion plant. The problem is complicated by the fact that the Monroe company has a competing plant in Albion, upon which it is losing money every day it continues to operate the system.

Telephone men were interested in one point raised by the attorney for the Monroe company in his application for a modification, but the commission turned no light on it. He argued against that part of the order requiring the Monroe company to set up 8 per cent. for maintenance and depreciation, asserting that it was too high. The other Nebraska companies have been arguing to the commission, in casual confabs, that 8 per cent. is too low to cover actual maintenance and depreciation. Naturally, if they could get it increased, and there was not enough

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left of the gross revenue to pay 6 or 7 per cent. dividends, they could make that fact the basis of a claim for better rates. The novel reason assigned by the attorney for the Monroe company for objecting to 8 per cent. as too high was that if they had to reserve that much it would prevent the company from paying dividends.

The decision of the commission was unanimous.

Upholds Commission's Authority to Fix Rates in Missouri.

Judge Slater of the Cole county circuit court, on October 1, upheld the order of the Missouri Public Service Commission, permitting the Missouri Central Telephone Co., of Fulton, Mo., to increase its rates. The court held that the commission has the power to fix rates and the city council has no such right.

On March 20, 1917, the commission authorized the Missouri Central company to increase its rates as follows: Single line residence service, from $1 to $1.50, and single line business service from $2 to $2.50 per month. Protest was filed by the city of Fulton against this increase, alleging that the Missouri Central was operating under a franchise that had been given its predecessor, which had a rate clause providing that the rate for residence service be $1 a month and the business rate $2. The attorneys for the city later appealed to the courts, on which appeal the court has recently entered a ruling.

Charges for Switching Rural Lines in South Dakota.

The South Dakota Railroad Commission has ruled that where a rural party line is connected with a local exchange on a switching basis at a rate of not to exceed 25 cents per month or $3 per year as fixed by statute, its subscribers are entitled to intercommunication and the switching of messages to all lines and with all subscribers connected with that exchange. This arrangement, the commission holds, is reciprocal and all subscribers of the local exchange and of all other rural lines connected with it are entitled to intercommunication with all subscribers on rural party lines thus connected without the payment of any additional charge.

Complaint in this case was filed by the Norway & Pleasant Telephone Co. vs. the Beresford Telephone Co. It appears from the records that the complainant operates five rural lines extending from Norway and Pleasant townships in Lincoln county, to the city of Beresford where it has switching connections with the exchange of the defendant. The complainant does not operate a telephone exchange at any point and has been furnished switching service at Beresford by the Beresford Telephone Co. for many years.

It was alleged by the complainant that the respondent refuses to agree to furnish switching service from any of the complainant's lines to any other of its lines for less compensation than 50 cents a month, and the commission was asked to order the respondent to render switching service from any and all of the complainant's five lines and between any of the complainant's lines at a compensation to be fixed by the commission.

From the testimony in the case it appeared to the commission that the subscribers receiving service on the five lines in question need and desire switching service at the exchange in Beresford and that such switching service must include the switching and interchange of messages between the subscribers of the complainant located on its five different lines.

The contention of the respondent appears to be that the complainant should establish exchange facilities for the switching of messages between its five lines, and receive switching service at the Beresford exchange over one wire with the subscribers of all other lines connected with the Beresford exchange, or pay $6 per year per telephone for the switching of messages between the five lines in question.

As previously stated, the commission holds that where a rural party line is connected with a local exchange on a switching basis, its subscribers are entitled to intercommunication and the switching of messages to all lines and with all subscribers connected with that exchange.

The commission states that it is unable to see the distinction between switching messages between these five lines and the switching of messages between any other lines or any one of the five lines to any of the lines connected with the Beresford exchange. Single lines are switched at the Beresford exchange at a switching fee of not to exceed 25 cents per month or $6 per year, while the respondent contends that for the five lines in question the fee should not exceed 50 cents per month per telephone.

"It will thus be seen," the commission states, "that in order to obviate this objection on the part of respondent, and in order to obtain this switching service at the statutory rate of not to exceed 25 cents per month or $3 per annum, the only act or thing necessary to be done by the complainant would be to dissolve its present organization, and permit the subscribers of each of the five lines to take over the individual lines with which their respective places of residence were connected, and by this simple operation and without in any manner affecting the expense of switching messages at the Beresford exchange, they would be entitled to switching service at the statutory rate. A statement of this contention and this elaboration suffices to show that it is untenable and wholly without merit."

After careful consideration of the testimony in the case, the commission, on September 29, ordered the Beresford Telephone Co. to furnish switching service to the complainant for each of the five lines connected with the Beresford exchange at a rate not to exceed 25 cents per month or $3 per year for each instrument connected.

Apportionment of Value of Property in Fixing Rates.

The Oklahoma Supreme Court remanded to the state corporation commission the case in which telephone rates were lowered at Ada, after the Pioneer Telephone & Telegraph Co. had asked for an increase in rates.

In remanding the case the court did not say the schedule of rates fixed by the commission was not equitable and asserted that after further review of the case it might be found that the rates were just, but held that a false basis of obtaining the valuation of the company's property had been used by the commission.

It was held by the court that the value upon which the return of the company is to be based should not be obtained by adding a number of separate items, but by taking a comprehensive view of each of the elements of the property, and considering them all, not as separate things, but as inseparable parts of one harmonious entity and exercising judgment as to the value of that entity. The commission was given 60 days to figure the value of the property on the new basis and to consider new testimony which the Pioneer company desires to submit.

Before any change was made in the Ada rates, $2.50 a month was charged for a business line, $1.50 for a residence single line, and $1.25 for a residence, two-line. The company asked that the rate be $2.50 for a business telephone, $2 for a residence single line and $1.50 for a residence two-line. The commission fixed the rates even lower than they had been in the first place, with $2 for a business line, $1 for a residence single line and 75 cents for a residence two-line.

Interchange Service Ordered at Watertown, S. D.

The South Dakota Railroad Commission, on September 20, ordered the Dakota Central Telephone Co. to re-establish the connection at its exchange in Watertown of the blank wire of the Hamlin County Farmers Telephone Co. which extends from the latter company's exchange in Thomas to the city limits of Watertown through and over this connection to permit of service with the rural subscribers of the Hamlin County company located on lines in the territory north of the Tarum switch and west of Hazel on the basis of $1.50 per year per telephone.

In response to the complaint of the Hamlin County company that the respondent has terminated such connection with its Watertown exchange about March 1, 1917, the Dakota Central company alleged that during the existence of the switching contract a check of the business disclosed that more subscribers were enjoying interchanging of service than for which payment was made and that messages were interchanged without compensation that should rightfully have been routed as toll business.

In ordering the connection restored the commission has required and commanded the Hamlin County Farmers Telephone Co. to immediately put into effect and enforce reasonable rules and instructions governing the proper policing of the interchange business authorized in this order, and the enforcement thereof to be made effective if the connection ordered in this case is to be continued.

Increased Rates Granted at Ree Heights, S. D.

The South Dakota Railroad Commission, on September 29, issued an order authorizing the Ree Hills Telephone Co. to establish the following schedule of increased rates at Ree Heights:

Main line, business, per month.....$1.75
Main line, residence, per month..... 1.25
Party line, rural, per month..... 1.50

A discount of 25 cents per month per telephone is to be allowed where the business and residence rental rate is paid on or before the 15th day of the current month and where the rural party line rental rate is paid quarterly during the first month of the current quarter.

The company is further ordered to at once overhaul its lines and equipment, take up slack, properly guy its poles where needed, trim trees where they are causing interference, remove grounds and improve its telephone service in every respect.

This order became effective October 1.

Telephone Company Has Right to Change Numbers and Prefixes.

A telephone company has the right to change the numbers and the prefixes assigned to its patrons in the telephone directory as may seem to it necessary and best in accord with rendering efficient service to the public as a whole according to a recent ruling of the Utah Public Utilities Commission.

The decision was rendered in the case of the Citizens Coal Co., the Federal Coal Co. and the Central Coal & Coke Co. against the Mountain States Telephone & Telegraph Co. The complaint alleged that the changing of the prefixes and the numbers of their telephones was causing them great and irreparable damage, and also that discrimination had been used in changing the numbers of some of the companies, while those of their competitors were not changed. Customers had become accustomed to the old numbers of the companies and considerable expense had been entailed in advertising those numbers, all of which would now be lost, according to the complaint.

The decision, after discussing the question of whether changes of which complaint is made were covered in the rules and regulations of the company, and of whether due notice of those rules and regulations had been given to the coal companies, goes on to take up the question of whether the contract as referred to is one that should be observed as being necessary and reasonable and not against public policy. It is held:

"The changes no doubt occasioned some inconvenience to the plaintiffs, as well as some expense in the changing of said numbers on advertising matter. Such inconvenience and expense should be allowed only when it appears to be reasonable and necessary and in keeping with the rules, regulations, notices and contracts under which service is rendered to the patrons of defendant company. . . .

If the telephone company is required to give service that is reasonable and efficient, it should be allowed in giving such service a reasonable latitude to adopt and enforce such regulations that will permit it to render such expected and required service. Should any other rule than this be promulgated by the courts and by the commission, then it would be vain under all conditions and circumstances to expect a corporation to render reasonable and efficient service to the general public.

We are of the opinion that under the showing there was a reasonable necessity, in the interest of public service, for making the changes complained of.

As to the question of discrimination, raised in the complaint of the plaintiffs, it would appear that the plaintiffs do not strongly contend, or at all, that the showing was sufficient to prove the necessary elements which go to make up a case of discrimination."

Right of Subscriber to Talk Back to Telephone Operator.

The right of a telephone subscriber to talk back to a telephone operator in case of poor service, is upheld in a temporary ruling of the Missouri Public Service Commission recently announced by Commissioner Simpson. The case originated upon the complaint of John F. Metzger, of Plattsburg, who alleged the company had taken out his telephone after he had criticised the local telephone operator rather sharply because of poor service.

The telephone company is ordered to restore Mr. Metzger's telephone, and give him service. Later, the commissioner states, a permanent ruling will be made, elaborating upon the rights of Missouri telephone users, to criticise operators in cases of poor service.

Asks Franchise Amendment to Permit Increase in Rates.

The Valley Telephone Co., of Bay City, Mich., has asked the council for an amendment to its franchise so as to permit it to make a slight increase in its rates. The matter has been referred to the ordinance committee and city attorney.

Summary of State Commission Hearings and Rulings.

ALABAMA.

November 13: Continued hearing in the case of the city commission of Birmingham vs. the Southern Bell Telephone & Telegraph Co., in which a reduction in rates in the city of Birmingham is asked.

FLORIDA.

October 3: The commission denied the application of the G. & J. Telephone Co. for authority to discontinue its service to East Point. No. 566.

October 3: The commission imposed a fine of $150 upon the Hastings Telephone Co. for failure to make report of its lines and stations in operation on June 30. No. 565.

October 3: The commission dismissed the case of W. A. Zachary vs. the Florida Telephone Co., the telephone company having agreed to furnish service to Mr. Zachary and remove all discrimination in compensation for telephone service. No. 567.

November 6: Hearing in the matter of the application of the Peninsular Telephone Co. to increase its telephone rates at Lakeland as follows: Private line business service, from $2.50 to $3.50 per month; selective party line business service, $2.25 to $2.50; private line residence service, $1.50 to $3. Permission is also asked to reduce the rate for residence extension from $1 to 75 cents per month.

ILLINOIS.

September 12: The Chicago Telephone Co. is authorized to construct its telephone line across and under the 33,000-volt transmission line of the Northern Illinois Utilities Co. in Seneca township, McHenry county, Ill. The plans show that the construction will be such as to meet the requirements of the commission. No. E-803.

September 18. The Scottville Telephone Co., owned and operated by Willis Hayes, is authorized to increase its telephone rates from $1 to $1.25 per month. Under the old rates a depreciation fund was not provided for. The new rates will allow 6 per cent to be set aside for depreciation fund and also pay a dividend of 3.39 per cent on the cost new, or 5.44 per cent on the cost new less depreciation. At the hearing held in this case on May 3, the commission ordered Mr. Hayes not to enforce the new proposed schedule of rates until it should be approved by the commission. Mr. Hayes, however, proceeded to collect the new rate of $1.25 from several of his subscribers. The commission now orders him to refund to the subscribers from whom the advanced rates had been collected, all such collections so made in excess of the old rate of $1 up to October 1, 1917, the date the new rate is to go into effect. No 6175.

October 8: Hearing in Chicago on the

petition of the Chicago Telephone Co. for authority to sell certain real estate located in Chicago to Herman H. Hettler in exchange for certain other real estate. Case 7212.

October 8: Hearing in Chicago in the case of the city of Belvidere vs. the Belvidere Telephone Co., on complaint of insufficient service at Belvidere. Case 6998.

October 8: Hearing in Chicago on the application of the Belvidere Telephone Co. for authority to increase rates in Belvidere and vicinity. Case 7111.

October 10: Hearing in Chicago on the application of the Rossville Telephone Co. for authority to increase rate for extension telephones in Rossville and vicinity. Case 6834.

October 11: Hearing in Chicago on the application of the Morrison Telephone Co. for authority to increase its rates for rural service at Morrison. Case 7132.

MINNESOTA.

October 9: Hearing at Glenwood, Minn., on the application of the Northwestern Telephone Exchange Co. to increase its local exchange rates.

October 19: Hearing at Albany on application of Albany Telephone Co. to increase local exchange rates.

MISSOURI.

November 1: Hearing on application of Southwestern Bell Telephone Co. for permission to increase its rates at Springfield.

NEBRASKA.

October 2: Complaint of Mrs. J. R. Kelly that Nebraska Telephone Co. refuses to furnish four-party service on Fremont exchange; filed.

October 3: Complaint of O. C. Teel, secretary of Farmers' Independent Telephone Co. at Red Cloud that Glenwood Telephone Co. refuses to furnish long distance service. The hearing disclosed a complicated tangle of rates and service, due to the fact of diverse ownership of exchanges and toll lines. The Glenwood company has an exchange at Bladen which gives free service to Campbell and Upland, owned by other companies. Toll messages from Campbell to Red Cloud go through Bladen and then over a toll line jointly owned with Indian Creek company. The rates were 5 and 10 cents, for three and five minute talks, each company retaining money collected.

Bladen and Campbell, both in free zone, quarreled over imposition of rates, and to settle respective rights the matter was referred to the commission. It was developed that while there was a 5-cent rate on toll messages this was to subscribers. Non-subscribers paid 15 cents between Bladen and Campbell. The commission indicated that it would require this discrimination to be removed, and the probable result will be to make a toll charge between Red Cloud and Campbell 20 cents, the same as on the Lincoln company's copper wire, instead of the 5 cents charged.

October 3: Complaint of Held Auto Co. that Platte Telephone Co. refuses to furnish booth for garage; filed.

October 4: Hearing upon application of Ohiowa Telephone Co. for permission to increase business rates from $1.50 to $2 a month; residence from $1.25 to $1.50 and party lines from $1 to $1.25. No appearances were made against the increase. The company made a complete financial showing, and matter was taken under advisement. Its earnings last year were $4,733.50. It has assets of $18,742.57, and a capital stock of $10,000.

October 12: Hearing upon plea in abatement filed by the Lincoln Telephone & Telegraph Co. in demand of Glenwood company for physical connection between competing exchanges at Pauline, Adams county. The plea is based on the allegations that the Glenwood company does not come into court with clean hands and that it is violating the law in that it is collecting a 10-cent toll charge between Pauline and Blue Hill without permission from the commission.

NEW YORK.

September 28: The commission ordered the New York Telephone Co. to restore the free service between Argyle and Hudson Falls and Glen Falls, on complaint of telephone subscribers of Argyle.

OHIO.

September 16: Warren & Niles Telephone Co., of Warren, granted permission to sell bonds and stock to secure funds with which to pay off its indebtedness to the Bell company caused by the recent merger, to buy new switchboards and build an underground system.

September 22: Lima (Ohio) Telephone & Telegraph Co. granted permission to issue $25,000 worth of treasury stock, one-half common and one-half preferred.

October 18: Hearing on the proposed merger of the properties of the Home and Central Union telephone companies in Piqua, Ohio.

OKLAHOMA.

September 12: Case brought by C. A. Melton and other citizens of Stillwater against the Pioneer Telephone & Telegraph Co., seeking a reduction in rates, dismissed.

September 21: The commission granted the Comanche Telephone Co. authority to raise the rates for its service in the town of Comanche to $2.50 a month for a special line service in the business district; $1.25 a month for special line service in the residence district, and $1.25 a month for rural lines. The rates became effective October 1.

OREGON.

September 11: Petition filed by the Tillamook County Mutual Telephone Co. for permission to increase its residence telephone rates from $1 to $1.25 a month and its business telephone rates from $1.50 a month to $1.75.

PENNSYLVANIA.

September 26: Complaint filed by District Attorney T. B. Wilson against the ruling of the Bell Telephone Co., which prohibits subscribers calling individuals on toll calls and making reverse charges at Smethport, Eldred, Duke Center and Bradford.

September 29: Complaint filed by the city of Oil City against the increased rates recently established by the Petroleum Telephone Co.

SOUTH DAKOTA.

September 20: The commission ordered the Dakota Central Telephone Co. to re-establish the connection at its exchange in Watertown of the blank wire of the Hamlin County Farmers Telephone Co. at the basis of $1.50 per year per telephone. Case 2914.

September 20: The commission authorized the Farmers & Merchants Telephone Co. to increase its rental rates. Case 2824.

September 29: The commission ordered the Beresford Telephone Co. to furnish switching service to the Norway & Pleasant Telephone Co. for each of the five lines connected with the Beresford exchange at a rate not to exceed 25 cents per month or $3 per year for each instrument connected. F-428.

September 29: Ree Hills Telephone Co. authorized to increase its telephone rates at Ree Heights. F-446.

September 29: Application of Springs Mutual Telephone Co., of Hoven, to increase rates, denied, the company having failed to show that the increase was justified. F-466.

September 29: The commission authorized the Bradley-Crocker Telephone Co., of Crocker, S. D., to increase its rental rate from $1.25 to $1.50 per month, with a discount of 25 cents per month if payment is made during the first month of the current quarter. F-471.

UTAH.

September 20: In the case of the Citizens Coal Co., Federal Coal Co. and Central Coal & Coke Co. vs. the Mountain States Telephone & Telegraph Co., the commission ruled that a telephone company has the right to change the numbers and the prefixes assigned to its patrons in the telephone directory.

September 21: Petition filed by Levi Pearson and others, of Oakley, asking the commission to direct the Kamas Woodland Telephone Co. to provide better service and improve the condition of its poles and lines. The petitioners allege there are so many subscribers on some lines that it is impossible to reach parties desired within a reasonable time. The defendant's poles and lines are not "pleasing obstacles to visitors in the valley," the petition reads. An adjustment of rates is asked.

October 1: Representing 20 farmers who have installed a telephone line seven miles long for their own use, Thomas H. Evans, of Monticello, protested against a doubling of the monthly charge for connections with the lines of the Midland Telephone Co. Mr. Evans says that when the farmers built their small independent line they arranged with the La Sal Telephone Co. to pay 50 cents a month each. The La Sal company system has been leased by the Midland company, and the connection charge has been advanced to $1 a month.

WEST VIRGINIA.

October 9: Hearing on the application of the Shinnston Telephone Co., of Shinnston, for permission to increase its rates $2 per year for each class of service.

WISCONSIN.

October 2: Hearing on application of Milladore Telephone Co. for authority to increase rates. U-1152.

October 9: Hearing in the case of Monroe County Telephone Co. vs. C. M. & St. P. Ry. Co. and C. & N. W. Ry. Co., relative to refund. R-2224.

October 11: Hearing at Plainfield on application of Union Telephone Co. for authority to increase rates. U-1001.

October 11: Hearing on application of Troy & Honey Creek Telephone Co. for authority to increase rates. U-1160.

October 16: Hearing on application of Briggsville & Big Spring Telephone Co. for permission to increase rates. U-1163.

October 17: Hearing on application of Muscoda Mutual Telephone Co. for authority to establish toll rates. U-1165.

October 19: Hearing on application of Athens Telephone Co. for authority to increase rates. U-1168.

October 23: Hearing on application of Barron County Telephone Co. for authority to increase rates. U-1172.

October 26: Hearing on investigation, on commission's own motion, of rates rules and practices of Necedah Telephone Exchange. U-1166.

Independents Are Doing Things

Texas Independent Telephone Association Plans State-Wide Campaign of Publicity for Local Companies Looking to Increase of Rates—More Than 400 Members Now on Association's Roll—Ohio District Meetings Very Successful

Publicity Campaign Planned by Texas State Association.

The Texas Independent Telephone Association will conduct a campaign of publicity throughout the Lone Star state for the purpose of informing the public as to the conditions under which telephone companies must operate at present, if the plans of the officers of that organization are carried out.

At recent district meetings of the association, held in Waco and Greenville, Texas, resolutions were unanimously adopted recommending to President R. B. Still of the state association that a meeting of the directors be called as soon as possible, for the purpose of devising ways and means of carrying on as long as necessary a thorough campaign of educational publicity in the newspapers of the state.

The directors' meeting will be held early this month. In the meantime, plans are going forward for the inauguration of the advertising campaign as soon as it is approved. It is proposed to have prepared a series of concise articles explaining the present high cost and scarcity of telephone materials, and the scarcity of skilled labor, and touching upon other conditions brought on by the war and effecting telephone companies. Supplementing these, a series of display advertisements will also be prepared.

This matter will be cast in plates, so that it will not be necessary for the local newspaper to set it in type, and will be sent out, either through a state syndicate to the newspapers, or to Independent companies throughout the state and turned over by them to their local newspapers.

Independent telephone men throughout the state will note with keen interest the results of the publicity thus obtained, many of them believing that it will be of great value to the industry, by informing the public as to some of the troubles which beset the telephone companies at present. It is thought also that such a campaign will do much to pave the way toward the raises of local rates which must come in many of the smaller towns of Texas if present conditions keep up much longer.

District Meetings of the Ohio Independent Association.

Wartime conditions are creating so many new problems in the conduct of telephone companies, for the solution of which a swapping of ideas by groups of experts is valuable, that at four district meetings of the Ohio Independent Telephone Association last week it practically was decided to hold at least two, and possibly three, meetings annually, instead of only one as heretofore.

The meetings last week were of districts 1, 8, 7 and a joint one of 5 and 6, respectively, in Cleveland, Toledo, Lima and Dayton.

The meetings held this week were of district No. 1, Wednesday, October 10, in Canton, and a joint one of districts 3 (southeastern Ohio), 4 (southern Ohio) and 9 (central Ohio), Friday, October 12, in Columbus.

At last week's meetings there was an aggregate attendance of 250 officials and representatives of Independent companies. The chief problems discussed were: Preferential telephone service for the United States government; wartime taxation and increased costs of materials and operation.

High prices of materials of all kinds used in telephone maintenance and new construction have prevented Independent companies from profiting under wartime conditions, in spite of big gains in the number of telephones in use, it was said at the meetings. Increases in the cost of labor and materials, it was asserted, have not only kept down profits but have in a number of instances been responsible for the increasing of rates.

District associations went on record in favor of strict economy in telephone operation to the end that future rate increases may be kept to the lowest possible level.

Frank L. Beam, president of the state organization, in his annual report, declared government or municipal ownership as well as municipal competition have been rendered impossible by the war. The financial conditions of the larger cities, he said, are such that an effort to finance telephone operation would place them in danger of bankruptcy. The cost of new construction he placed at 60 per cent. more than during normal times.

The report showed that telephone companies in Ohio own and operate more than $78,000,000 worth of property upon which they pay more than $1,500,000 in

The District Meeting of the Texas Association at Brownwood, Texas, on September 14, Was an Enthusiastic One.

taxes each year. There are 780,000 telephones in operation in the state, of which 465,000 are owned by the Independents, Mr. Beam reported. The former total represents a gain of 750,000 telephones since 1895, when there were less than 30,000 telephones in use in Ohio.

C. Y. McVey, president of the Ohio State Telephone Co., who attended the meetings, made an appeal to the managers and executives of all companies to support the government's campaign to place the second liberty bond issue. He said employes of his company had taken more than $130,000 worth of the bonds. A large proportion of the bonds were subscribed for by the operators, linemen and other employes outside of the company's official staff.

Close co-operation between Independent companies in furnishing the government with preferential telephone service also was urged by Mr. McVey. At the present time government calls are given the right of way over everything else by all companies.

The Independent companies of Ohio will be represented in the French trenches in a short time by two companies in the army signal corps service. Officials of the companies have given assurance they can furnish further signal corps units if called on by the government.

Meeting at Waco, Texas, September 20, Had a Representative Attendance of Texas Telephone Men.

Series of Successful District Meetings Held in Texas.

The Texas Independent Telephone Association has recently completed a series of six very successful district meetings, held in various cities throughout that state during the month of September. Starting with a meeting in Austin, on September 11, local conventions were held in Temple, September 13; Brownwood, September 14; Tyler, September 18; Waco, September 20, and Greenville, September 21. The officers of the association are well satisfied with the results of the meetings, at which more than 200 Independent telephone men of the Lone Star state were gathered together, and considerable business of importance to Independent telephony in the state was transacted.

One result of the meetings is the intention by the state association to undertake an important campaign of state-wide publicity, for the purpose of informing the public in Texas as to the conditions confronting telephone companies on account of the high costs and scarcity of labor and materials.

The Texas association has announced that it will hold its regular annual convention for 1918 during March, in Dallas. Arrangements are already under way for the meeting, which, it is expected, will be by far the largest gathering of Independent men ever held in the state. Under the administration of President R. B. Still of Tyler, who is general manager of the Gulf States Telephone Co., the Texas organization has had so far a very successful year, and has, to date, something more than 400 active members. The association set for itself, at its annual convention last February in Dallas, the task of securing 500 members during 1917, and the present outlook is that the mark will be reached before the next convention.

L. S. Gardner, of Waco, auditor of the Texas Telephone Co., is membership secretary of the association, and has actively carried forward the work of securing new members. E. C. Blomeyer, of Waco, secretary of the Texas Telephone Co., is secretary of the Texas organization, and E. M. Powell, of Dallas, manager of the Dallas Automatic Telephone Co., is treasurer.

District Meeting of Central Indiana Association.

The district meeting of the Central Indiana Independent Telephone Owners' Association, scheduled to be held on Tuesday of next week, October 16, at Winchester, promises to be one of the best meetings held by the district association. An operators' school will be conducted in connection with the convention by W. S. Vivian, of Chicago, secretary-treasurer of the United States Independent Telephone Association.

Addresses will be made by Wm. M. Bailey, general manager of the Richmond (Ind.) Home Telephone Co., and J. A. Browne, secretary and general manager of the Eastern Indiana Telephone Co., of Winchester, and also president of the Central Indiana association.

Help and Wage Problems of Kentucky Companies.

The help and wage problems are just about the most troublesome that the telephone companies operating in Kentucky are having to deal with at this time. With costs of all materials and supplies advancing or already advanced to undreamed of figures, but with no possibility of rates being advanced correspondingly in more than a very few cases, the matter of getting new workers or holding those already on the rolls becomes a difficult one.

The Central Home Telephone Co. has been advancing wages to as general an extent as possible and this advance has now reached a total of about 25 per cent. The Louisville Home has also done the same thing. Difficulties in obtaining new operators are specially trying at this time with women and girl workers in demand on all sides and the various companies are doing whatever suggests itself to make the employment attractive. The limits are soon reached, however, and things are rapidly getting to the point where any new business is regarded with disfavor.

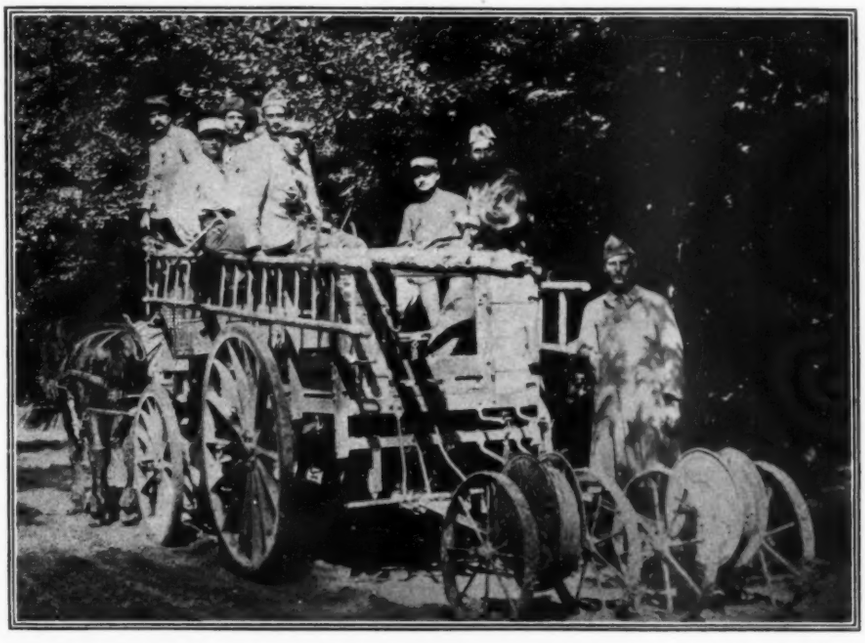
Statements are being made about an Independent company in a Tennessee town which is actually refusing new business and, in spite of franchise restrictions, installing service only after the applicant has agreed to bonus payments for it.

Practical Subjects—Discussions

"Telephony's" Representative in France Comments on Telephone.

All TELEPHONY's readers know that "Joe" Graffis, formerly assistant advertising manager, is over in France, from where he has written very interestingly of his adventures. The latest commmunication from Joe was written on the back of a photograph he had taken of some of the military telephone trouble-shooters. The photograph is reproduced on this page. Joe's breezy communication and his comments relative to the photograph were:

"Here is a crew of typical French military trouble-shooters. All have seen service in front line trenches and have been wounded. At the point where this picture was taken, they had been repairing broken lines caused by Boche poor markmanship.



French Military Trouble-Shooters after Repairing Telephone Lines Back of the Front.

We are directly opposite a big munition parc. These parcs are often bombed by the Boche flyer, but in this case they missed not only the munition dump but a large village nearby where they could have easily gotten a baby or two. As you approach the 'firing line,' the overheads disappear—some city ordinance, I believe.

Talking about approaching the front, I never played golf, but I have, they tell me, a darn good approach. Well, I've sure learned to respect the telephone—it tells how, when, and where to fire, and the operators! Well, I'd hate to make a complaint to some of them."

Spurs vs. Poles—The Use and Care of Spurs.

The type of spur in use today uses up a pole pretty quickly, also causing rot to set in, states W. A. Winfield, in The Monthly Bulletin. Besides, there is the defacement of the pole to consider, and the danger of splinters in the hands of subsequent climbers—we mean, of course, the human, and not the steel variety of climbers. Two things should therefore always be borne in mind when using spurs, which experience, alas, teaches are too often forgotten:

1. Only wear spurs when necessary.
2. Use your spurs on the pole carefully.

How often we note men using spurs on stepped poles, either because it is easier work to take shorter steps than the pole step spacing, or because an easier position for working on the pole can be assumed by standing on spurs, rather than on the pole step.

There are times when spurs are necessary on stepped poles, but they are few. More often it is a matter of laziness or convenience, and it is up to the foreman to see that they are used no more than absolutely necessary. Besides, the fool that, knowingly or unknowingly, makes a mis-step, or stands on a messenger, and decorates the cable with a neat little punched hole, or a scratch penetrating the cable sheath, is still to be found at large, though the species is gradually getting scarcer.

Few men who climb unstepped poles try to climb so as to injure the poles as little as possible, yet this neglect brands an otherwise good man as a poor lineman. No one can possibly consider it a sign of a good lineman who sees a pole just climbed, bearing a heavy crop of gigantic splinters sticking out, and probably with pieces two to four inches long torn out bodily. This can be avoided almost entirely by a few simple rules applied to the practice of climbing.

1. Make no useless steps, and do not dance all round the pole after you reach your position, seeking a better footing.
2. At each step set your spurs in the pole with a moderate effort. If you rely entirely on your weight, the spur will penetrate the pole too slowly, and spawl or groove the wood before taking hold solid.
3. Keep the body at arm's length from the pole, so as to keep the legs on a good angle with the pole. Absence of this will cause your spur to cut down instead of in, and flake out splinters.
4. Above all things, when descending, lift your leg when withdrawing your spur. If the spur leaves the pole the way it entered, little damage will be done, but breaking out the spur by throwing out the knee, or descending too rapidly, will play the very mischief with the pole.

Great care should be taken in sharpening spurs. The old hooks, by reason of their shape and angle, marked up poles very little, and many old-timers, except for very large poles, still prefer them to spurs.

The spur should be filed to a triangular shape, with sharp angles. It should be so filed that when in use, the base of the spur triangle, and not an angle, should lie square across the pole, thus affording the maximum support for the wearer, without danger of slipping. This angle varies slightly with different wearers, and can only be arrived at by experiment or by observation.

The marking of an angular, as against a rounded spur, is comparable to the action of a driven cut against a wire nail. To get someone to note the angle at which you use your spur while climbing, is the easiest way to check up your spur angle. Also get an experienced climber to note your climbing, and point out the defects.

All this may seem a lot of talk about a small thing, but it is far from a small thing, as "pole life" statistics show. Besides, any good workman should pride himself on first class work, down to the last motion. This is being insisted on by many large concerns, who spend vast sums on efficiency studies which in the end boil down to studies of individual motions, many of them far smaller than that discussed here.

Johnstown Telephone Co. to Install New Board and Cables.

The Johnstown Telephone Co. is about to begin the installation of a new switchboard in its office on Jackson street, Johnstown, Pa., increasing the facilities

there, and the installation of new cables in conduits put underground during the past summer in the Eighth ward. Thousands of dollars are being expended in improvements in order to take proper care of the growing business. To date this year, the company has more new subscribers than the number secured during the entire twelve months of last year.

Sunshine and Shadows Along the Telephone Trail.

By Well Clay.

There's a dirty shirt on the washstand;
A collar on the knob of the door;
A pair of socks on the bureau;
Some trousers on the floor.

A towel hangs over the mirror;
Some shoes grace the seat of a chair;
In the hallway someone is shouting,
For "Ma," down the kitchen stair.

Every closet and drawer has been opened,
By a hurricane you'd really suppose,
But there's really nothing unusual:
It's just "Dad" a changing his clothes

I have seen some telephone men do just this kind of a stunt, when they started out to do a piece of work or to install a telephone. They would get all ready to start and then begin to rummage around in the warehouse in a more or less vain endeavor to remember just what they were going to require for the job.

They would open every drawer to see if anything was there which they would need, depending on the sight of the article to jog their memory. Then they would stop occasionally to yell to one of the other boys to see whether such and such an article was put into the rig after finishing some job of recent date. After using up two or three times as much time as would have been necessary, if they had gone at the matter when and how they should, they start off for the work, only to find out, when too far off to remedy the oversight, that they had forgotten some of the most important material or tools which were necessary for properly completing the job.

If you will remember, "Father" usually forgot to locate the towel until he got his eyes full of soap. Then he had to "Holler to Ma" to help him out of his dilemma.

Leaving a job without properly looking after the tools, to see if they are loaded onto the wagon, is a fine thing for the hardware man.

Another thing which looks bad and creates a poor impression with the property owner, is to leave a lot of odds and ends of wire lying about on the grass, under poles where work has been done. It makes bad business for the party who accompanies the lawn mower on its next trip along the boulevard and is no doubt the originator of much plain and fancy profaneness.

Children will often pick up these small pieces of wire and throw them over the wires in the lead a' ove, thus "shorting" circuits and making necessary additional trips of the troubleman. When this happens out in the rural districts and a line is put out of order, it becomes less and less of a joke.

Broken glass, too, from damaged insulators should not be left about where barefooted children may tread on them. They make a nasty wound from the fact that they usually turn when stepped on and enlarge the cut.

Old cross arms which have been replaced should not be left lying on the ground near or leaning up against the pole from which they have been taken for the reason that they are unsightly, if nothing else. They may be worth nothing for any purpose, even fuel, to the company. In that case they are of no use to the property owner, even if he knew he could have them for the asking, or without.

Stumps from old or broken poles which have been replaced, should be dug out and not left to bother some one else who may wish to use the same ground later. It is your business to leave the ground as you found it after you are through with it.

Old guys that have gone slack from a removal of the strain which they formerly held should be removed. They are usually in the property owner's way in the first place and the company owes it to him to clear the way for him, once the necessity has passed for their occupying his ground. It is usually found that old guy wire, especially in these times, has some value for use in other parts of the plant. In case the wire is old and stiff, one can usually sell it to farmers for mending fences and such work.

The old holes should be properly filled up and old guy stubs dug out and hauled away. In case anchor rods have been used, and it is a good deal of work to dig them out, in addition to a real damage to have such a large hole made in the sod, it is admissible to saw them off with a hack saw at a reasonable distance below the ground. The sod should then be replaced in as good a condition as possible and all left ship-shape. This will leave an impression with the property owner that you are efficient, careful and conscientious. If you do these things, the chances are that you qualify.

Care should be taken in removing telephone sets from houses, that as little damage as possible is done to woodwork and to the appearance of the places where the wires have been.

Some cut off the wires at the telephone and yank them through the wall in such a manner that oftentimes the hole through the plaster is much enlarged. They give the wire outside a jerk where it has been tacked to the side of the house and a shower of perfection nails is scattered all about the place, for kids to step on. Then, too, I have seen a man place a Yankee screwdriver in the screw slot and give a lunge at it which, when it slipped, sent the screwdriver through the wall plaster, or marred the woodwork of the telephone or house.

I have seen many repairmen come out of a house, where they had been to replace batteries, and throw the old ones on the lawn or in the garden or alley, whichever place came the handiest. Old batteries should be taken back to the warehouse and thrown into a barrel or box kept for that purpose, for oftentimes they will come in handy for one purpose or another. In the days of high prices for these necessary articles, it may even come about that they will be worth shipping back to the manufacturers, in case of a further shortage of supplies. In any event, one should take the brass off them before having them hauled to the dump.

Another bad practice, which is avoidable, is the habit some have of slapping a telephone against the wall (in installations) and ramming a screw home, only to find that it strikes between two laths where it will not hold. It is then necessary to raise or lower the instrument so as to find a solid backing for it, thus leaving an unsightly hole in the wall paper above or below. It is easy to locate a solid spot before placing the screws if one has a reasonably good ear and is careful to sound the wall before hand.

I like to see a lineman or repairman —in rural districts he is both—remove his rubbers, in bad weather, and his hat on entering a residence, to repair a telephone. Certainly he should not clank in with his hat and spurs on and trail across a clean floor or rug to the telephone; then tramp around in that spot while examining the instrument until he leaves a reminder of his visit in the shape of a muddy spot for the ladies to clean up.

His act of respect to the ladies in removing his hat and rubbers is never lost on them, no matter how slovenly may be their own persons and kitchens. Because a house is plain and the furniture very humble, is no reason why you should think you have a license to tramp around in it as you choose. To the lady, that house represents home. She may or may not take pride in keeping it spotless, but be sure she resents in her heart your action in assuming that it is not to be respected the same as you would respect the finest residence in town.

There are thousands of ways to do a piece of work but only one way to show the lady of the house that you are a real gentleman, no matter what your calling. That is to be as considerate of her home as you would be of the home of a millionaire or a director in the company. It costs nothing and is worth a good deal to you, even if it is lost on the other party.

APHORISM: Preparedness and politeness always pay.

"Telephony's" Home Study Course for Telephone Men

A Complete Presentation of the Principles Underlying Modern Telephony in All Its Branches—Arranged Systematically So That Regular Reading and Faithful Study Will Qualify Ambitious Men for Higher Positions—Prepared Under Supervision of Stanley R. Edwards—This Section Written by Jay G. Mitchell

Quiz Questions on the Preceding Installment.

787. What is true of the operating routine in ringing on toll lines and in ringing the local connected telephone on toll trunked connections? How is the operation of the toll operator's ringing key made to result in the sending out of the proper form of ringing current over the local telephone circuit? Are all toll service trunks equipped with alternating current relays for this purpose?

788. What causes the display of the lamp signal *E*? What causes this lamp to become dark?

789. What is the nature of the marginal operation of a relay? Why is the relay *B*, in Fig. 242, marginal in operation? Why must the operation of relay *B* be postponed until both the terminals of the trunk have been connected ?

790. Trace the path for the flow of operating current through the winding of relay *B*. Why must the tip side of the ringing generator be connected to ground in offices in which this trunk is employed?

791. What is meant by "strength of current control" for telephone relays?

792. Outline the circuit changes that result from the operation of relay *C* in response to the removal of the called subscriber's telephone receiver from the hook, Fig. 242.

793. Explain the arrangement for advising both the toll operator and the local trunk operator when to remove the connection. Does the circuit arrangement shown require that the connection be removed whenever the lamp signal *E* is displayed after it has once been displayed and subsequently darkened?

CHAPTER XXVI. The Multiple Toll Switchboard (Continued).

794. *The recording trunk circuit.*—While the operation of the toll service trunk shown in Fig. 242 involves the employment of a battery-current-controlled ringing relay, the operation of the recording trunk associated with it involves the use of high and low resistance alternatively-operated bridged relays. This circuit is shown in Fig. 243.

Since the local office equipment with which it is to operate, is of the differential line relay type, the non-grounded terminal of the common battery is connected, through relay windings, to both strands of the cords. When the local operator inserts the plug into the local multiple jack of the recording trunk, the bridged relay, *A*, is at once operated.

Operating current flows from the grounded terminal of the common battery through the trunk impedance coil to the tip side of the trunk, the tip conductor of the trunk, the winding of the bridged relay, *A*, the sleeve conductor of the trunk, the winding of the local cord supervisory relay (not shown) and the common battery.

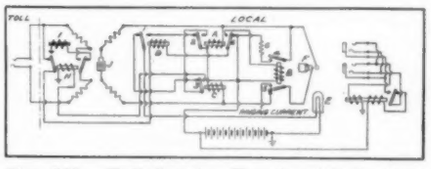


Fig. 242. Toll Service Trunk with Battery Operated Ringing Relay.

795. *High and low resistance bridged relays.*—The relay, *E*, however, is also connected directly across the trunk circuit . Relay *E* will not be operated while relay *A* is connected across the trunk circuit on account of its relatively high resistance. In other words, relay *A*, whose resistance is approximately 200 ohms, shunts practically all the current away from the winding of relay *E* whose resistance is approximately 10,000 ohms, absolutely preventing the operation of *E*.

The operation of relay *A* creates a path for the flow of current from the grounded terminal of the common battery through the normally open contact, 1, of relay *A*, the normally-closed contact 8 of relay *C*, the normally-closed contact 4 of relay *D*, the lamp *F*, and the common battery. This causes the lamp *F* to be displayed, apprising the recording operator of the receipt of a trunked call.

When the toll-recording operator answers the displayed signal, the insertion of the plug into the trunk jack operates the extra spring contact of the trunk jack and completes a path for a flow of current traceable as follows:

Starting from the grounded terminal of the common battery through the extra contact of the trunk jack (now closed), the winding of the trunk sleeve relay *B*, the winding of the relay *C*, and the common battery. This energizes both the relay *B* and the relay *C*. At the normally-closed contact 8 of relay *C*, the energizing current through the signal lamp, *F*, is interrupted. At the normally-open contact 5 of relay *C*, a path is completed for current flow through the winding of relay *C*, the normally-open contact 5 (now closed), the winding of relay *D* and the normally-open contact 1 (now closed) of relay *A*.

As relay *D* is operated, its normally-open contact, 3, is closed, completing the path for a flow of current from the grounded terminal of the common battery, the winding of relay *D*, the contact 5 of relay *C*, the winding of relay *C*, and the common battery.

This obviously insures a continuous flow of energizing current and locks both relay *C* and relay *D* in an operated position by a circuit condition dependent upon their own operated contacts. But when relay *D* is operated, it interrupts the current flow over the trunk and through the winding of relay *A*, releasing it. The grounded terminal of the common battery is still maintained in connection with the winding of relay *D* at operated contact 3, although contact 1 is opened again by the release of relay *A*.

796. *Result of removal of shunt.*—The removal of the shunt around the winding of relay *E*, through the lower resistance of the winding of relay *A*, diverts current into the path through the winding of relay *E*, operating it. When relay *E* is operated, the non-grounded terminal of the common battery is connected through the normally-open contact 7, to the back contact 6 of relay *B*.

This connection provides that whenever relay *B* is released, the non-grounded terminal of the common battery will be connected to *both* terminals of the winding of relay *C*. In other words, the current flow that previously passed through the winding of relay *D* and relay *C* to reach the common battery will now

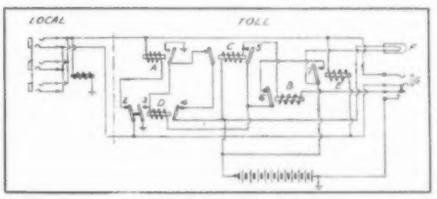


Fig 243. Recording Trunk Circuit with High and Low Resistance Bridged Relay.

pass directly to the common battery through the winding of relay *D* and the two contacts *E* and 7 without passing through the winding of *C*.

As a result of this condition, relay *C* is released. But relay *B* cannot be released while the toll recording operator permits the answering plug to remain in the trunk jack *G*. Relay *E*, on the other hand, will be retained in the operated position while the local cord remains in the local trunk multiple, provided the shunt due to relay *A*, or the recording position answering cord circuit, is removed.

The release of the relay *C* does not cause the lamp *F* to be again displayed because the energizing circuit for the lamp is open at the normally-closed contact 4 (now open) of relay *D*. The holding condition due to a flow of battery current over the circuit through the winding of relay *D* and the normally-open contact 7 of relay *E* is continued until such time as relay *E* is released by the removal of the connection at the local multiple jack. When relay *E* is released, relay *D* is also released and the equipment, both ends of the connection having been removed, returns to its normal condition in readiness for the next call.

It is obvious that the distinguishing mark of this recording trunk circuit is the use of two relays of widely-different resistance in parallel, the operation of the high resistance relay being delayed until the low resistance shunt path through the winding of the other shall have been removed.

This expedient is not common in manual equipment engineering practice but it is reasonably positive and reliable. The difference between the resistances of two relay windings must be quite considerable, however, in order to eliminate uncertainty in operating results. If only a small difference is found, the variation in the strength of the two successive magnetic fields, when the shunt is removed, in the high resistance relay may be so slight as to render adjustments very difficult.

797. *Toll trunk selective ringing keys.*—Where the toll trunk is employed to carry connections with local equipment requiring the selection of one party from several on the local party line circuits, it is necessary to equip the local terminal of the service trunk with selective ringing key equipment. This may be exactly the same as that used in the local cord circuits in principle but it is obvious that the mechanical construction of the keys must be somewhat different.

When the local switching operator has connected with the local line in the multiple and has set the trunk ringing key for the proper type of selective ringing current, it is essential that the key may remain in the same condition in readiness for the moment of calling the local station. The toll operator must be able to ring once or as many times as may be necessary in order to secure the attention of the local station. Each ring must deliver the same type of ringing current to the local circuit.

(To be continued.)

War Tax Bill As It Affects Telephone Companies.

The war revenue act of 1917, which became a law October 3, provides that beginning November 1 a tax of five cents is to be paid on every toll message the charge for which is 15 cents or over. Telephone companies are required to collect this tax and make monthly returns to the district collectors of internal revenue.

There are also other taxes which affect telephone companies such as the capital stock tax and the income tax.

Option on Stock of Automatic Electric Co. Expires.

The option to Wm. S. Todd, of New York, on a majority of the capital stock in the Automatic Electric Co., given in connection with the installation of the automatic system in Chicago in 1912, expired by limitation on October 1.

Queries on Theory and Practice

Cross Talk on Grounded System Probably Due to Ground.

For the last 15 years we have operated a complete grounded system accommodating about 100 private and 32 rural lines. Induction did not bother us to speak of, but the last month it has been so bad as to seriously interfere with service. Our ground is practically perfect, consisting of a gas pipe driven 20 feet into the ground, with No. 6 copper wire leading to the switchboard—all connections securely soldered. Besides this ground we have two or three other grounds just as good.

We have about four blocks of 50-pair cable which has always given perfect satisfaction. We split the pairs and bring each line through grounded. On a voltmeter test with pairs open at terminals, we get a very slight reading, which is so slight as to be almost unnoticeable. On a 25-volt scale we get a movement of the hand about the thickness of a hair, between pairs, and also to ground. Could this slight cross be the cause of our trouble? If so, is there any possible way to find the defective spot and remedy it?

Evidently you do not have very good insulation conditions in your cable. It will be necessary to know the voltage of your testing battery and the resistance of your voltmeter in order to advise you definitely, however.

Possibly your ground pipe has corroded off below the surface. It is quite likely that a new ground will remedy your trouble. If the pipe has been in the ground for anything like 15 years, it is likely that a new one is needed. If you are sure that there are no bullet holes or cracks in your cable sheath, we suggest that you renew your central office ground rod.

When the cable pairs are split there will always be some cross-talk.

Parallel Lines of Grounded System and Cross Talk.

Could you give me information through the columns of TELEPHONY on the following subject? We have a grounded line exchange and have 12 party lines that run parallel for from one to six miles. Part of these lines turn off before they reach the six miles. As you may know, the cross talk is very bad on them. Is there any way to overcome this without making a metallic exchange out of it? Is it true that a coil of the same resistance as the line that it is intended for, being placed in series on the grounded side of line at switchboard, will overcome or partly overcome the cross-talk difficulties? If so, is it necessary that it be of exactly the same resistance and where can these coils be obtained?

Upon the conditions that you outline, the only method open to you to reduce the cross talk is to move the wires farther apart on the poles or to make the system metallic.

Any other expedient will reduce transmission as much as it does cross talk and merely make matters worse.

Size of Wire for Fire Alarm Calling Circuit.

The fire department is installing a call system, the bells to be rung from the telephone office, 28 stations in all. They will use 500-ohm ringers, one to be installed in each fireman's house. Will No. 14 B. B. galvanized iron, insulated wire be large enough? This will be a grounded system.

The resistance of a fire alarm circuit should be as low as possible in order to insure that all the alarm ringers will receive as nearly as possible the same amount of current. For this reason it would probably be much better to use No. 12 wire if iron is to be used.

The ground connections should be carefully made with the water pipes. If an ordinary ground rod is used, unless the circuit is under daily test, there might be a danger, in some localities, of a failure in the ground part of the circuit at a critical time.

If a metallic circuit is decided upon, for the foregoing reasons, it should be of copper wire. In this way the loop resistance will be kept at as low a value as possible. If metallic copper is used No. 12 B. & S. should be the size selected.

Biographical and Personal Notes

Arthur J. Seymour, chief engineer of the Tri-State Telephone & Telegraph Co., St. Paul, Minn., was born at Ottawa, Canada, April 13, 1876, and secured his education in the grade schools and at St. Joseph College, Hull, Canada.

His first experience in the telephone field was in 1895 and 1896 as wireman for

Arthur J. Seymour.

the Northwestern Telephone Exchange Co., at Minneapolis, Minn. In 1897 he was made inspector for that company and in the spring of 1898 he entered the employ of the Tri-State Telephone & Telegraph Co., then named the Mississippi Valley Telephone Co., installing switchboards.

During the next 12 or 13 years he held various positions, as inspector, special inspector on construction, chief installer, wire chief, plant chief and engineer of the Minneapolis plant. About four years ago he was promoted to his present position of chief engineer for the Tri-State.

Mr. Seymour has been a member of the national Independent telephone association for several years and has been active on a number of committees, including the present committee on inside plant of the United States Independent Telephone Association.

He is also a member of the St. Paul Athletic Club. Mr. Seymour is very energetic and quick to see the application of a proposition, after first ascertaining all the facts relative to it. He has the force and personality to accomplish things rapidly without creating friction. These qualities, combined with practical ability to quickly understand the details and application of engineering problems, well qualify him for his work with the Tri-State.

Frank V. Newman, secretary-treasurer of the Michigan Independent Telephone & Traffic Association, Grand Rapids, Mich., has resigned his position and after October 15 will be associated with the Indianapolis Telephone Co., Indianapolis, Ind., as assistant to President William Fortune.

Mr. Newman has been connected with the telephone business for nearly 30 years. He began his career as office boy in the Detroit exchange of the Michigan State Telephone Co., with which he was associated for 17 years, becoming assistant manager of the exchange. In 1901 he was transferred to Jackson, Mich., as manager, later returning to the Detroit office in the capacity of office manager.

In 1905 he severed his connection with the Michigan State company to become assistant general manager and auditor of the Citizens Telephone Co., of Grand Rapids. In 1912 he became manager of the Dallas Automatic Telephone

Frank V. Newman.

Co., of Dallas, Texas, resigning in the fall of 1913 to return to Grand Rapids as secretary-treasurer of the Michigan Independent Telephone & Traffic Association.

Mr. Newman has many friends in the Independent field who will be glad to hear of his new association. His practical experience in both the business end and the traffic branch of the industry well qualify him for his new work.

C. M. Peklenk, traveling auditor of the Central Home Telephone & Telegraph Co., of Louisville, Ky., is receiving dolences over the death of his wife.

Major E. O. Baker of the Signal Corps Reserve was a visitor at TELEPHONY's office this week. Major Baker, who was formerly manager of the Wabash Valley Telephone Co., at Paris, Ill., has completed the training course at Ft. Leavenworth, Kan., and has been assigned to the cantonment at Battle Creek, Mich., where some of the enlisted men of the signal corps reserve will receive their training. His address is now Camp Custer, 85th Div., 310th signal field battalion, Battle Creek, Mich.

Captain Terry W. Allen of the Signal Corps Reserve, formerly president of the Allen Properties, at Corinth, Miss., is now located at Camp Gordon. Captain Allen has just completed the training course at Leon Springs, Texas. His address is now Camp Gordon, Atlanta, Ga., 307th battalion.

Obituary.

Judge C. B. Kennedy, "The Old Man Eloquent" of South Dakota Independents, and president of the Canton Cooperative Telephone Co., of Canton, S. D., died recently at his home in Canton following a short illness. Mr. Kennedy was born in London, England, in 1849. He removed to the United States with his parents when three years of age. He was educated in the common schools of Iowa and was a graduate of Lenox college and the state university. He was admitted to the practice of law in South Dakota in 1880 and at his death was one of the most prominent and successful practitioners of the state.

Mr. Kennedy was at one time president of the South Dakota Independent Telephone Association and has featured prominently at all of its annual conventions, acting as master of ceremonies at

The late Judge C. B. Kennedy.

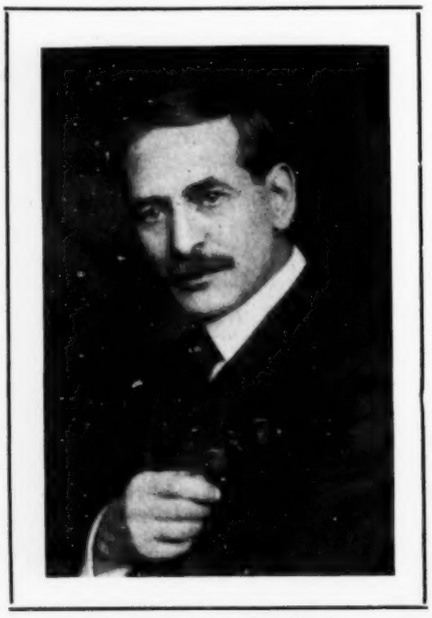
many of the banquets. He leaves his widow, Mrs. Blanch Kennedy; three sons, Millard B., who is acting as manager of the Canton company; Verne C.; Benjamin R., and one daughter, Cornelia.

From Factory and Salesroom

Convention: Illinois, Springfield, November 7-8; Ohio, Columbus, November 22-23

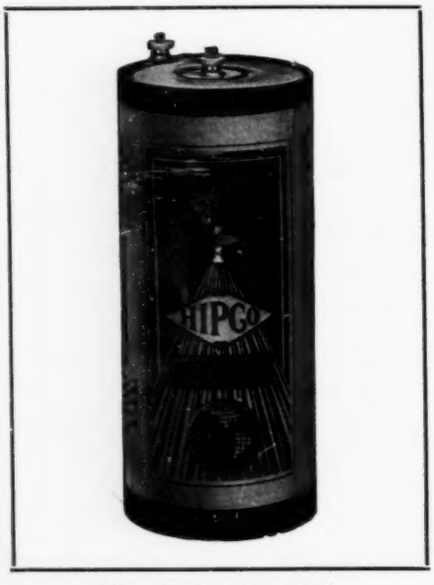
Hipwell Mfg. Co. Now in the Dry Battery Field.

The Hipwell Mfg. Co., of Pittsburgh, Pa., is now engaged in the manufacture of dry batteries. H. H. Hipwell, its



H. H. Hipwell, President.

president, was formerly, it will be recalled, a telephone manufacturer. In the earlier days he made magnetos for the Swedish American, American Electric and Eureka Electric companies, in addition to



Hipwell No. 6 Dry Cell.

a complete line of telephone switchboard accessories and parts. The same company as now was then interested in the Independent telephone field.

Associated with Mr. Hipwell senior are his two sons, H. T. Hipwell and E. W. Hipwell, who are acting as vice-president and secretary, respectively, of the company.

The Hipwell Mfg. Co. has been making its No. 6 dry battery for the past two years and has developed a substantial business among the telephone companies and in the hardware business. It also manufactures a complete line of flashlights and flashlight batteries.

It has been supplying the navy, signal corps and aviation departments of the United States government with Hipwell flashlight batteries. Every navy yard in the United States is being equipped with Hipwell flashlight batteries.

Business conditions are very good, Mr. Hipwell advises. Considerable business is now booked; more, in fact, than in any

H. T. Hipwell, Vice-President.

previous year, and extensive plans are being made to materially increase the company's manufacturing facilities. The plant occupies an area 160 feet square and the company has recently purchased adjoining factory space for increasing its facilities.

Sale of Lexington (Ind.) Plant.

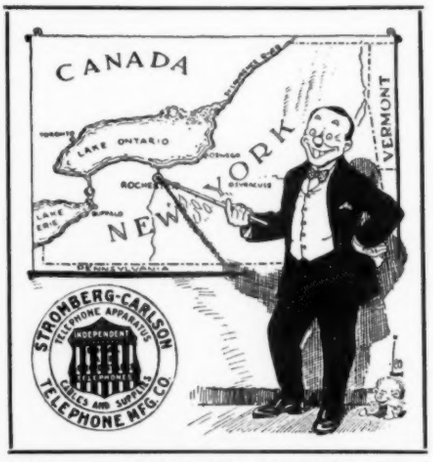
The Scott County Telephone Co., of Seymour, Ind., has assumed control of the telephone plant at Lexington and will begin at once to make extensive improvements to the system.

Wakarusa (Ind.) Plant Sold.

The Home Telephone Co., of Elkhart, Ind., has purchased the telephone exchange at Wakarusa for a consideration of $20,500.

Stromberg-Carlson Blotter Calendar for October.

"Where we put the fact in satisfaction" is the terse remark of Phoney Bill as he points out Rochester on the map



"Where We Put the Fact In Satisfaction."

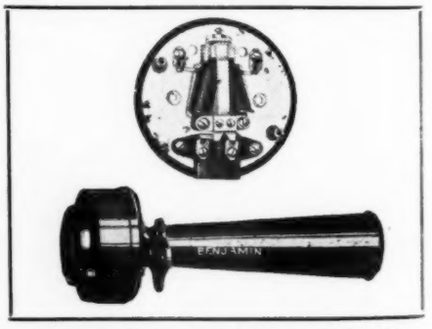
in the accompanying reproduction from the Stromberg-Carlson Telephone Mfg. Co.'s October calendar. It is with considerable pride that Phoney Bill directs attention to the home of "Quality Apparatus."

Benjamin Industrial Signals for Noisy Factories.

Noise is the usual accompaniment of industry. It seems impossible to get along without the tremendous waves of discordant sound, unless humanity discontinues most of its activities.

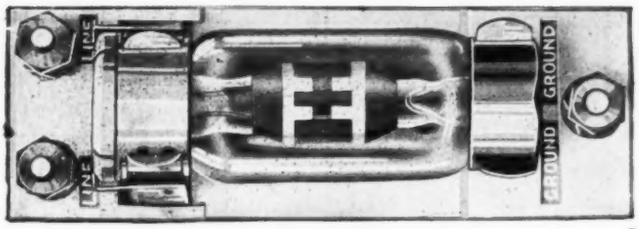
In machine shops, mills, power houses, where there is a great deal of machinery moving, the matter of proper signals presents a problem. Ordinary gongs cannot be heard so messengers were used.

In these times, however, human hands and brains are worth more in producing. They are more necessary for producing



Telecode Relay and Industrial Signal.

than for use as messengers. Into this branch the Benjamin Electric Mfg. Co. has stepped with a system of powerful signaling apparatus, which are said to work effectively and well, even under



VAC-M ARRESTERS

The "ONE BEST" Protection for Telephone Property.

Because they give the absolute and never failing protection that your lines require.

They are made on the vacuum principle that makes good under all conditions. No matter how hard the lightning may strike the blast is neutralized when both lines discharge into one evacuated container maintaining equal distribution and balance.

Write for VAC-M CATALOG

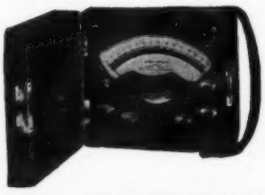
NATIONAL ELECTRIC SPECIALTY CO.
303 TERMINAL BLDG., TOLEDO, OHIO
ALGER SUPPLY CO., General Sales Agents, Peoples Gas Bldg., Chicago, Illinois.

Trouble Detectives!

PIGNOLET Portable Testing Meters will locate any kind of trouble besides measuring volts and amperes; will also determine resistance of coils, lines, ringers, etc.

VOLTMETERS
AMMETERS
VOLT-AMMETERS

Suppose you let us send you a copy of the PIGNOLET Catalogue. It's worth while.



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Indispensable for Construction Work

Security Pole Seat
Number Two

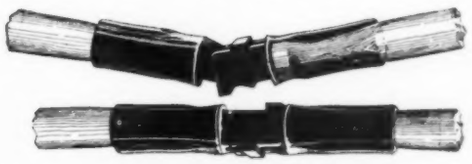
A strong but light weight seat. Angle iron construction with continuous rim bent, but not notched, at corners, thereby insuring a seat of great strength and safety coupled with neat appearance. Galvanized.

$1.55 Each

Security Cable Car No. 3

Ideal for emergency work and trouble shooting. Strong, light, rapid, adjustable and comfortable. Weight only 28 pounds.

$5.60 Each



Security Conduit Rods

Cannot buckle or uncouple in the duct. Couplings are swedged on and cannot come loose. With Security Rods one man can handle long runs easily and quickly as they are light in weight and point of friction between rod and duct has been reduced to a minimum.

3 Foot Rods—65 Cents Each
4 Foot Rods—75 Cents Each

Ask for Security Bulletin Number Six

The F. Bissell Company

226-228-230 Huron Street

TOLEDO OHIO

conditions where the noise would drown out all other forms of signals.

The apparatus shown in the accompanying illustration applies particularly to the telephone business. It is necessary that all telephone calls reach their intended destination. This can be done with the use of the Benjamin telecode relay in connection with the Benjamin industrial signal.

The telecode relay is an extremely sensitive apparatus, and, it is contended, will successfully operate even on the most heavily loaded lines. Its construction is such that it will safely control the circuit to the industrial signal even if its current supply is the lighting circuit current. The relay is self-restoring, and therefore the industrial signal is under the complete control of the telephone operator.

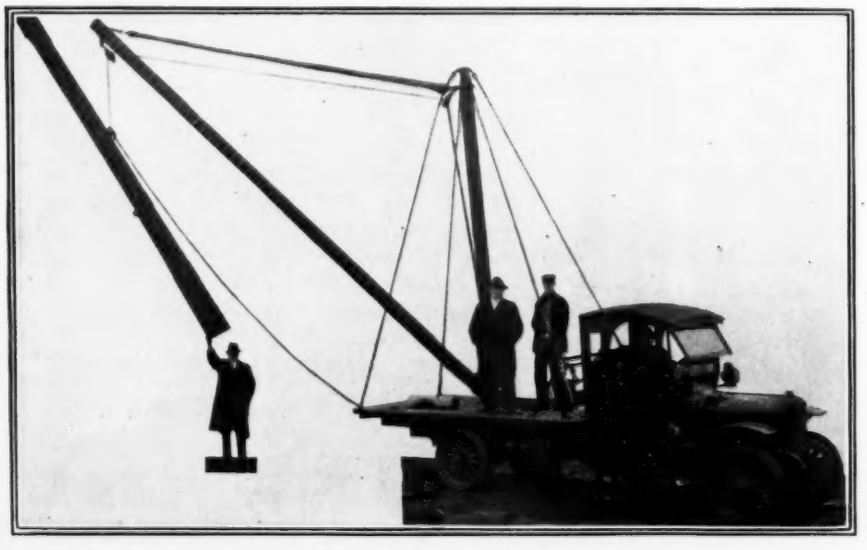
The industrial signals are instantaneous in operation, and readily follow any system of code signaling which may be adopted. They are National electric code standard, and may be equipped with windings for operation on voltages as may be specified. However, the Benjamin company recommends utilizing the lighting circuit current for energizing the industrial signals, as this does away with the batteries and their up-keep.

In a word, the combination of the Benjamin telecode relay and the Benjamin industrial signal, used in place of the telephone bell, is said to solve the problem of how to find one's man quickly.

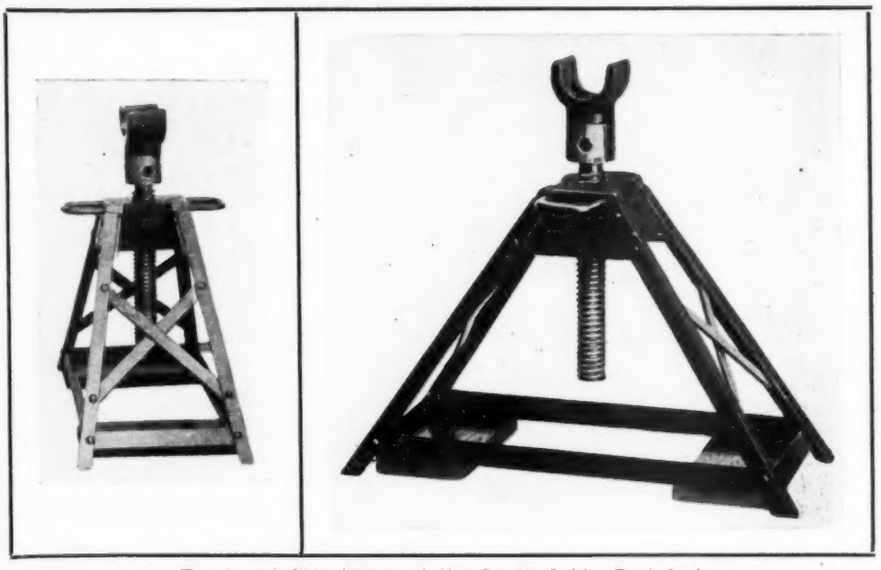
Republic Motor Trucks Adaptable for Use in Telephone Work.

A recent pamphlet of the Republic Motor Truck Co., of Alma, Mich., describes models Nos. 10 and 11, a modification of which is shown in the accompanying illustration and is adaptable for telephone usage. In the circular referred to are illustrations showing many of the Republic trucks which have been sold for various uses; in fact, there are few industries that are not represented in this collection of Republic trucks.

The Republic Motor Truck Co., which has its general offices at Alma, Mich., has salesrooms and service stations in all of the leading places of the country.



Republic Motor Truck Equipped with Power Winch.



Front and Side Views of the Swett Cable Reel Jack.

An Adjustable Reel Jack for Handling Telephone Cable.

In the handling of lead covered telephone cable, reel jacks are quite necessary. The accompanying illustrations show front and side views of an adjustable cable reel jack which has been designed to fill the need for a strong jack to carry a heavy load and also light enough so as to be easily portable.

The type of jack illustrated is made in two sizes and will swing a 7,000-lb. reel. The jack known as the No. 1 model has a screw 1¾ ins. in diameter with a length of 14 ins. The height of the stand to the bearing point in the yoke is 20½ ins., while the height when the screw is up to its limit is 31½ ins. The length of the base is 26 ins. and its width 12 ins. The weight of this reel jack is 54 pounds. In the No. 2 jack the screw is of the same diameter but its length is 16 ins., while the height of the stand to the bearing point in the yoke is 30½ ins. When the screw is up to the limit the height is 42 ins. The length of base of this model is 40 ins. and its width is 16 ins. The weight of the stand is 65 lbs.

These jacks have but recently been placed on the market and have met with great success. The manufacturer, A. L. Swett Iron Works, Medina, N. Y., has shipped them to many of the larger construction companies in the country and will be glad to furnish full information to all companies interested.

New Booklet on Explosives.

E. I. Du Pont De Nemours & Co., of Wilmington, Del., have just issued a very interesting booklet entitled, "The Giant Laborer." It points out and proves the advantage of using Du Pont explosives for various agricultural and miscellaneous uses. It explains what benefit explosives have been in land clearing, ditching, drainage, subsoiling, tree planting, orchard cultivation and other uses. It is a companion or sequel to "Handbook of Explosives," another recent booklet, the latter book containing full instructions as to "how" to handle and use explosives. Both books will be sent on application to the Du Pont company.

Paragraph.

THE BARRETT CO., of Chicago, has issued a folder on "How to Make Farm Timbers Rot-Proof" by treatment with Carbosota. An explanation is made of what Carbosota means and open tank, brush and dipping methods of treatment described. Copies of this booklet will be sent by the Barrett Co. to persons interested upon request.

Why A. T. & T. S-Hook Type Marline Cable Hangers are used by so many Telephone Companies.

The Houseline used in these hangers is made of the best quality long line, double dressed pure American hemp.

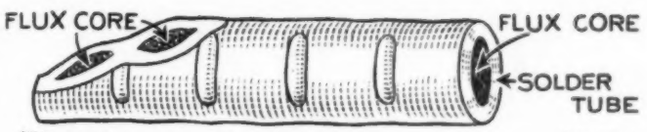
They are mechanically correct as to detail. The knots are tight and the loops are accurate in length.

The hooks are made of No. 9 spring steel wire regalvanized by hot dip process after they are formed.

In short A. T. & T. Hangers are made the best we know how. We have been making them for seventeen years. They are guaranteed to conform to all standard inspection requirements.

Write for catalogue and prices.

National Telephone Supply Company
CLEVELAND, OHIO



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KESTER ROSIN-CORE SOLDER

(ready to use)

does the job quickly and satisfactorily. Note the cellular formations (an exclusive KESTER feature) which prevent excess flow of rosin flux.

KESTER is by all odds the best for telephone work, as it is "ready to use."

Unless you have KESTER you do not know what a pleasure it is to solder.

FOR

- Motor Armatures
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- Telephone Instruments
- Telephone Relays
- Cable Terminals
- Cross Construction Bars
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Get samples or order trial quantity of your jobber.

CHICAGO SOLDER COMPANY
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Entrenched in America

Hundreds of miles of trenches in American cities have been dug—not for war, but to advance the works of peace—for ORANGEBURG Fibre Conduit, the duct of *safety* for all underground wires and cables for Central Station, Railway, Telegraph, Telephone and Signal service. *Book H.*

THE FIBRE CONDUIT COMPANY
ORANGEBURG, N. Y.

New York Boston Chicago San Francisco

Efficient Telephone Service

can be secured only by the use of efficient modern equipment. You will find such apparatus advertised in TELEPHONY.

OUR EXTRA HEAVY DOUBLE GALVANIZED WIRE INSURES

HIGHEST EFFICIENCY.
LONGEST LIFE.
LOWEST COST OF UPKEEP.

It's easy to determine, TEST IT.

As wire will test best, so also will it last best and give better satisfaction while it lasts.

We guarantee our wire to conform with all standard specifications as well as to be satisfactory to the purchaser.

IT'S THE ONE BEST PROVEN BY TEST.—*TRY IT.*

Handled by most representation jobbers and supply houses.

Write for samples, test and compare.

INDIANA STEEL & WIRE COMPANY
MUNCIE INDIANA U. S. A.

Waiting for a Call—Observation Post Reporting, Test Set also Convenient for Trench Work.

149th U. S. Field Artillery Kellogg Equipped.

While infantry troops are indispensable it is the artillery that is the great factor in the present struggle. A greater proportion of this arm to other troops, than ever before used, is now on the firing line, with a marvelous system of placing its fire just where and when it should be.

The 149th artillery, the former first Illinois artillery, is going to be a part of this irresistible, advancing force and is now at Camp Logan, Houston, Texas.

Modern artillery must have reliable, comprehensive and adaptable telephone equipment behind it. In addition to the many thousand field sets the Kellogg Switchoard & Supply Co. takes special pride in the complete portable switchboard equipment which has been furnished the 149th field artillery.

These little boards range in capacity from 5 to 15 lines each. They are made very compact and comparatively light, are easily handled, and can be mounted almost anywhere without any trouble. The boards are equipped with standard Kellogg apparatus throughout and will give high-grade service under the severe service conditions under which they will be required to operate.

Putting Through a Call for Orders.

Field artillery must be ready to move at a moment's notice, which means that the telephone equipment must be dismantled, moved and reconnected in a very short space of time. Artillery fire is directed mainly by men who figure the range for the gunners. They may be located two miles back of the firing line and receive their information from the men in the "lookouts," aeroplanes, etc.

The observers are equipped with the 15-line switchboards, having connection with the commanding officers as well as the artillerymen. If any of the guns are shooting beyond or short of the object, they telephone the gunners the correct position for their pieces.

The firing line is equipped with the 5-line switchboards, which are connected with the 15-line boards just mentioned. Two men are placed at each switchboard, one man operating the board

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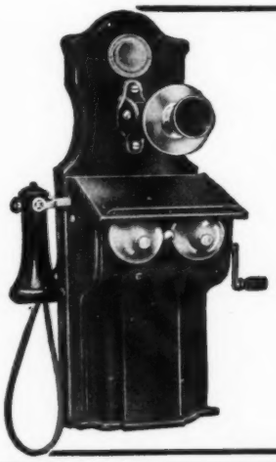

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while the other takes or gives the messages received or sent.

The Kellogg standard test set is used as an operator's set with these boards, also furnishing the ringing power. Being compact and light, they are easily handled. These standard test sets are also used by men in the outposts, etc., enabling them to give instant reports. They can be connected at any place. Wherever possible barbed wire fences are used as telephone wires.

One of the accompanying pictures taken in the quartermaster's tent shows an old-type Kellogg telephone mounted in the center. Six of these sets have been in continual use for years in the Illinois artillery and are said to be giving the best of service today. The artillerymen say they would not be without these Kellogg telephones.

How the 149th Feels About the Kellogg.

In describing this portable telephone system it is of interest to note that these switchboards are an excellent example of Kellogg prompt service. From the time of their ordering and designing but one week elapsed before their delivery.

The complete equipment consisted of eleven 15-line and nine 5-line switchboards and 65 special test sets.

The Stromberg-Carlson Company Keeps Its Employes on the Job.

In this time of labor scarcity and large orders it is very important that every factory employe be prompt and steady in attendance. The Stromberg-Carlson Telephone Mfg. Co. is strengthening the incentive in this respect by offering a weekly bonus for regular attendance. The following is quoted from the company's announcement which was posted on the factory bulletin boards:

"A bonus of one dollar will be paid weekly to each employe who has neither been tardy, absent, nor left the plant on pass for three consecutive weeks. The bonus will be paid at the regular pay period for the third week and will continue to be paid as long as a perfect score is maintained. If an employe fails at any time to maintain his record, the bonus will stop and will not again be paid until he has established a perfect score for three consecutive weeks. As the absence of any employe naturally reduces our production, no excuse will be considered except that an employe's bonus will not be affected if he is sent from the factory on company business by his foreman, nor by time lost due to injury received in the course of his employment."

About one-third of the Stromberg-Carlson factory employes are regularly receiving the bonus and reports of tardiness and absence are becoming much less frequent than formerly. Many of the employes who are now getting the bonus are also Liberty Bond subscribers and are in reality paying for their bonds with their bonus money. With just a little extra effort they are helping themselves and Uncle Sam too.

STATEMENT OF THE OWNERSHIP AND MANAGEMENT OF "TELEPHONY."

Statement of Telephony, published weekly, at Chicago, Illinois, for October 1, 1917.

State of Illinois, County of Cook, ss.

Before me, a notary public in and for the state and county aforesaid, personally appeared S. R. Edwards, who, having been duly sworn according to law, deposes and says that he is the editor of Telephony, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor and business managers are:

Publisher, The Telephony Publishing Co., 347 Monadnock Block.

Editor, S. R. Edwards, 347 Monadnock Block.

Managing Editor, S. R. Edwards, 347 Monadnock Block.

Business Manager, H. D. Fargo, 4932 Kenmore Ave., Chicago.

2. That the owners are: (Give names and addresses of individual owners, or, if a corporation, give its name and the names and addresses of stockholders owning or holding 1 per cent or more of the total amount of stock.)

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J. C. Kelsey, 1132 Lunt Ave., Chicago.
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3. That the known bondholders, mortgagees and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages or other securities are: (If there are none, so state.)

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4. That the two paragraphs next above, giving the names of the owners, stockholders and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and security in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association or corporation has any interest direct or indirect in the said stock, bonds or other securities than as so stated by him.

S. R. EDWARDS, Editor.

Sworn to and subscribed before me this 28th day of September, 1917.

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(My commission expires Oct. 24, 1917.)

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